DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
GEORGE K. BURGESS, DIRECTOR

MISCELLANEOUS PUBLICATIONS—No. 55

Weights and Measures

Sixteenth Annual Conference

OF REPRESENTATIVES FROM VARIOUS STATES
HELD AT THE BUREAU OF STANDARDS
WASHINGTON, D. C., MAY 21, 22, 23, AND 24, 1923

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REPORT OF THE SIXTEENTH ANNUAL CONFERENCE ON WEIGHTS AND MEASURES OF THE UNITED STATES.

HELD AT THE BUREAU OF STANDARDS, WASHINGTON, D. C., MAY 21-24, 1923.

FOREWORD.

Prior to 1921 the custom prevailed of printing these reports of the Annual Conferences on Weights and Measures verbatim. In that year and also in 1922, however, on account of the urgent need for economy in the expenditure of Government funds it was found essential to abridge somewhat the reports of the Fourteenth and Fifteenth Annual Conferences, and this was accordingly done.

In the case of the present report the same urgent necessity impels us to the same course, and, consequently, this report also will be found to be abridged. The same method of accomplishing this has been followed, namely, the material has been studied to determine what portions might be deleted with the least sacrifice of essential matter. The result has been that the proceedings of the first two sessions have largely been abstracted and the discussion in all other sessions has been curtailed when it appeared that this could be done without too great a loss of material of permanent usefulness.

This has resulted, as in the reports of the two preceding conferences, in the reports of State delegates being abstracted, since these are probably not of as general use in this report as discussions bringing out the consensus of opinion on some matter of importance, or resulting in some constructive action on a definite proposal. Especially is this last material of importance, since it often shows the necessity of the action taken and the data upon which the action is based, and, in addition, it will serve as a guide to the proper interpretation of the meaning of the conclusion in case any doubt arises in the mind of the reader as to its exact significance.

The bureau is confident that the report will be found not to have been greatly impaired as to usefulness by the necessary abridgments and deletions made.

GEORGE K. BURGESS,
Director, Bureau of Standards, and
President, Annual Conference on Weights and Measures.

FIRST SESSION (MORNING OF MONDAY, MAY 21, 1923).

The conference was called to order at 10.40 o'clock a.m. by Dr. S. W. Stratton, president of the conference, president of the Massachusetts Institute of Technology, and former director of the Bureau of Standards.

OPENING ADDRESS BY THE PRESIDENT, DR. S. W. STRATTON.

It gives me great pleasure to be with you again, especially since I had hardly expected to be able to do so. During the past year it has been necessary for me to readjust my affairs—take up my work elsewhere. It seemed the best thing to do, although I can assure you that it was with great regret that I left the work of the bureau, and especially the work of this organization. I became very much attached to it and feel that it will be productive of even more good in the future than in the past.

This is the sixteenth annual conference and I look back with a great deal of satisfaction to the things that have been accomplished by these meetings. The conference was organized to be a clearing house for matters pertinent to weights and measures. Such a clearing house was necessary, especially since the personnel of the weights and measures officials changes continually throughout the country, and it has served its purpose well. The having of one place where we can come together to compare notes with one another tends to bring about uniformity in the many questions appertaining to weights and measures.

There is another side of this conference which always appeals to me as being a very helpful one, and that is that in their technical work the officials assembling here have at their service the weights and measures division of the bureau. Officials throughout the country have made use of that division, and this contact has had a remarkable effect upon the character of the work performed and upon the equipment used. It has been the duty of the various officials to study this equipment to see where it could be improved—where the manufacture was defective and how that could be remedied—and the equipment has steadily improved as a result. As I have suggested, the division of weights and measures has always been at your service, and I know it will continue to be in the future.

I have been pleased to meet some of you in my new work. Not long ago in New York State, in Rochester, I was enabled to renew my acquaintance with the officials in that neighborhood, members of this organization here; and this afforded me a great deal of pleasure.

I will always continue to take the greatest interest in this organization, and I hope that you will continue it along the present lines, and I know that those in charge of the bureau will continue to place their organization at your service as in the past. You on your part

have helped the weights and measures division a great deal by bringing to it the benefit of your experience and they, in their turn, have helped you and will continue to help a great deal by giving you the scientific side and the technical side of weights and measures.

Now we have with us this morning the new director of the Bureau of Standards, Doctor Burgess, who has grown up, as it were, at the bureau; who is interested in all it has done; who is entirely familiar with the history of this organization and with its objects. It is with the greatest pleasure that I welcome him here this morning and introduce him to you as the new director, because I know that you can have in the future the same benefit from the bureau through him that you have had in the past. He will cooperate with you even to a far greater extent, because as time goes on those things grow. We do not go backward, and your connections with the bureau will grow stronger and stronger through the new director. I take great pleasure in introducing Doctor Burgess.

ADDRESS OF WELCOME TO THE BUREAU OF STANDARDS, BY DR. G. K. BURGESS, DIRECTOR, BUREAU OF STANDARDS.

Ladies and Gentlemen: On behalf of the Department of Commerce and the Bureau of Standards I take very great pleasure in welcoming you to this, the Sixteenth Annual Conference on the Weights and Measures of the United States. I understand that there are present delegates from States, counties, and cities, representatives of manufacturers, and other guests and visitors, and to all of you I extend most cordially all the facilities of the bureau during your stay here, and I hope most emphatically that those of you who are interested—and I assume all of you are—will want to become more intimately acquainted with some of the things that we are doing.

As Doctor Stratton has so kindly intimated, this series of conferences on weights and measures is by no means unknown to me. Although I have had no official connection with t, I always took a great pleasure in examining the reports of its meetings. In fact, I have attended every one of these conferences for at least one session, and sometimes for several. I came over, first, to see what you were doing; second, how you did it; and, third, for the inspiration that your type of work has given me, because it is a remarkable instance of cooperative voluntary work for a given result. I think I can say frankly that the work that these conferences has done, as looked at by a man on the side lines, if you please, has been most effective and remarkable and has had a profound effect on weights and measures throughout our great country.

Now, the Constitution of the United States, as you all know, places the questions of coinage and of the standards of weights and measures among the jurisdictions of the Federal Government. Although the Government has done but little in the exercise of this power, nevertheless I think it has been a very happy growth that we have had in weights and measures matters. In so far as it has been necessary to affirm the fundamental standards on which the weights and measures of the country are based, the Bureau of Standards has been delegated to act; in so far also as it has been found necessary in the

interest of uniformity of practice in interstate commerce, the laws affecting weights and measures have been in part allocated to the Federal Government. But both on account of fundamental law and geographic considerations the formulation and execution of practically all the laws on weights and measures have been left very largely to the States. Since this is true, a function of this voluntarily organized conference on weights and measures—a most important function, it strikes me—is to afford once a year the opportunity to the delegates from the various communities to get together for the purpose of comparing notes, interchanging ideas, and making suggestions, one to another, where necessary, to bring about in your States and municipalities uniformity of practice that is shown to be needed. It is largely up to the conference to make suggestions and voluntarily to bring about sufficient uniformity to meet the general needs.

Now, a word in regard to the Bureau of Standards as it is physically before you to-day. We most cordially invite you to visit the laboratories, of which there are a very considerable number, and I think it will be a recreation to call at some of these laboratories. Briefly, the building we are in is the electrical building, and you will find here all matters connected with electricity; immediately back of it is the radio laboratory; the building to the right is the administration building, containing also the weights and measures division and the optical division, weights and measures being located on the first two floors. The western building is largely devoted to problems of heat and power; the building forming the other portion of the square is the mechanical building and the power plant; the building immediately back, to the right, is the chemistry building; to the left of that the metallurgy and mechanics buildings are found; and the industrial building, the very large building to the right as you came up, I think you will find the most interesting of all, as it contains a series of industrial plants. In effect, you will find there work going on in rubber, textiles, paper, cement, structural materials, and so forth. I hope you will make this your home while here and visit those parts of the institution in which you may be interested.

I may also announce to you, and I think it may be of considerable interest to you to know, that on Friday there is to be a meeting here in this room of the State purchasing agents of those States having such agents, and representatives from certain other States. That meeting will be largely devoted to the question of purchases and the standardization of specifications. It will be addressed by the Director of the Budget, General Lord; by the Secretary of Commerce, Mr. Hoover; and others. Those who can stay over I am sure will find it a most interesting session.

Finally, I hope after you leave to go home from this, the Sixteenth Conference on Weights and Measures, that you will take with you a most pleasant impression; and, indeed, if there are questions that come up before the next conference that you wish us to take up either individually or by groups, I hope you will not hesitate to write us on the subject, and you will find us ready to cooperate to the utmost of our ability; and, again, let me say that it will be a primary object of the bureau to further the objects of this conference.

ABSTRACTS OF REPORTS OF STATE DELEGATES.[1]

CALIFORNIA.

By CHARLES M. FULLER, *City and County Sealer of Weights and Measures, Los Angeles.*

Mr. Fuller reported that practically no changes had been made in the California weights and measures laws during the past year. He said that the bread law recently enacted was proving very satisfactory to both bakers and consumers and noted increased cooperation between merchants and weights and measures officials.

COLORADO.

By H. CASADAY, *State Budget and Efficiency Commissioner.*

Mr. Casaday stated that Colorado was at present without comprehensive weights and measures legislation, but that he was in attendance at the conference at the request of the governor to gather information for the purpose of preparing suitable bills on this subject to be introduced into the legislature.

CONNECTICUT.

By THOMAS F. EGAN, *Deputy State Superintendent of Weights and Measures.*

Mr. Egan reported the enactment of a law authorizing the sale of nonstandard-size loaves of bread if labeled with their weight and of a law requiring coal to be sold by weight and outlined their provisions. He also mentioned other bills which failed of enactment and reported briefly on the gasoline-measuring devices inspected during the year by State and local inspectors.

DISTRICT OF COLUMBIA.

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets.*

Mr. Roberts commented upon the methods employed in supervising gasoline sales and upon the results of check purchases made. While, in general, the results were satisfactory, it was found necessary to bring prosecutions in a few cases. He also commented upon the satisfactory operation of the new weights and measures code passed two years ago, mentioning particularly the general observance of the requirements relating to standard-size bread loaves.

ILLINOIS.

By FRED BENJAMIN, *State Superintendent of Standards.*

Mr. Benjamin reported the progress which has been made in administering the new weights and measures law recently enacted in his State. Of 17 cities required to do so under this law 14 have already appointed city inspectors, and a force of 8 State officers has been appointed and the necessary equipment for field work, including 8 automobile trucks, provided. He stated that, in general, the merchants were willingly cooperating with the department.

[1] For convenience of reference these reports have been arranged in alphabetical order throughout.

INDIANA.

By I. L. Miller, *State Commissioner of Weights and Measures.*

Mr. Miller reported the enactment of a law fixing standards for hampers and baskets used for the sale of fruits, vegetables, and berries, to become effective November 1. He outlined the work of the department, and stated particularly that his inspectors had found that the standard-weight bread-loaf law was receiving the support of the bakers and was being almost universally observed.

LOUISIANA.

By J. N. Siren, Sr., *City Inspector of Weights and Measures, New Orleans.*

Mr. Siren spoke of the methods employed in examining gasoline dispensing devices, pointing out the necessity for frequent inspections on the part of the official and daily tests by the operator if accurate deliveries are to be maintained at all times.

MASSACHUSETTS.

By M. F. Gloster, *State Inspector of Standards.*

Mr. Gloster gave a detailed summary of the new weights and measures legislation enacted by the last legislature. This includes laws relating to methods of sale of and quality of coal, to notice by sealers to those using commercial apparatus, to transient vendors, and to peddlers. He stated that many other bills had been introduced but had failed of passage.

MICHIGAN.

By L. P. Strong, *Chief, State Division of Weights and Measures.*

Mr. Strong reported that the last legislature changed the Michigan weights and measures law by eliminating the word "knowingly" in the definition of certain violations, thereby making successful prosecutions possible. He briefly described the organization of the department and commented upon a coal survey made last fall.

MINNESOTA.

By R. F. Barron, *State Commissioner of Weights and Measures.*

Mr. Barron reported that the mechanical condition of commercial weighing and measuring devices examined during the past year was substantially the same as for the previous year. He outlined the year's legislative program, which was unsucessful, and announced the formation of an active State association of weights and measures officials.

NEVADA.

By S. C. Dinsmore, *State Sealer of Weights and Measures.*

Mr. Dinsmore reported the enactment of a public weighmaster law and of a law providing for the standardization of containers for and the grading of agricultural products. He also described work being done in relation to shrinkage on butter and on bread, and outlined, in general, the activities of his department.

NEW HAMPSHIRE.

By H. A. Webster, *State Commisioner of Weights and Measures.*

Mr. Webster spoke, in general, of the work of his department, particularly emphasizing what had been accomplished through restraining the activities of dishonest or careless dealers. He also reported the recent passage of a law fixing a standard box for farm produce sold at wholesale or retail.

NEW JERSEY.[2]

By J. Harry Foley, *State Superintendent of Weights and Measures.*

Mr. Foley summarized the accomplishments of the department for the past year, pointing out that both tests of commercial apparatus and reweighings of packages established new records for the department. He noted the failure of the legislative program, which included bills for standard-weight bread loaves and for the sale of dry commodities by weight, but stated that these bills would be reintroduced at the next legislative session.

PENNSYLVANIA.

By William B. McGrady, *Chief, State Bureau of Standards.*

Mr. McGrady outlined the provisions of certain bills introduced into the legislature but not yet definitely acted upon. He presented a detailed summary of the work done by State, county, and city inspectors in Pennsylvania and commented upon the excellent results being achieved by these officials.

RHODE ISLAND.

By William F. Goodwin, *State Sealer of Weights, Measures, and Balances.*

Mr. Goodwin reported that for some years his department and the various city departments had been operating very satisfactorily with practically no changes in personnel, although recently a number of changes had occured among the city officials. He said that during the past winter considerable attention was given to the coal situation.

SOUTH CAROLINA.

By A. H. Gibert, Jr., *Chief State Inspector of Weights and Measures.*

Mr. Gibert reported the enactment in his State of a new and comprehensive weights and measures code to replace a somewhat inadequate code previously in effect. He stated that the force of inspectors is being gradually increased and commented upon the splendid cooperation being received from merchants and consumers and from the press.

VERMONT.

By H. N. Davis, *Deputy State Commissioner of Weights and Measures.*

Mr. Davis reported that the appropriation for his department had been reduced to $5,000 for the onsuing year, which would, of course,

[2] This report was read to the conference by A. W. Schwartz.

seriously handicap the weights and measures activities in his State. He also told of the failure of passage of two bills—one in relation to the measurement of shingles and the other a standard-weight bread-loaf bill.

VIRGINIA.[3]

By LAWRENCE PAUL, *Chief, Bureau of Weights and Measures, Richmond, and* H. H. MATHEWS, *City Sealer of Weights and Measures, Portsmouth.*

Mr. Paul and Mr. Mathews briefly reported upon conditions in their respective cities, the former describing the license system by which his department is supported and the latter discussing the coal and wood situation in his jurisdiction.

WEST VIRGINIA.[4]

By G. F. DAUGHERTY, *State Commissioner of Weights and Measures.*

Mr. Daugherty reported two changes in the bushel list of his State, the legal weights for potatoes and buckwheat, respectively, being now 56 and 48 pounds. He also outlined the provisions of an unsuccessful bill for the enlargement of the functions and personnel of the State department and briefly discussed some of the activities of the department during the past year.

WISCONSIN.

By GEORGE WARNER, *Chief State Inspector of Weights and Measures.*

Mr. Warner announced that a standard-weight bread-loaf law had just been enacted in his State and gave a detailed outline of its provisions. He reported that several other bills were under consideration by the legislature, including two relating to the quality of coal and coke, but these had not yet been finally acted upon.

(At this point, at 12.50 o'clock p. m., the conference took a recess until 2.30 o'clock p. m.)

(At 1.30 o'clock p. m. the delegates assembled in the exhibition room, where an inspection was made and demonstrations given of the exhibits of the manufacturers of weighing and measuring devices.)

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[3] These reports were presented by Mr. Paul and Mr. Mathews in the absence of a State delegate.
[4] This report, prepared by Mr. Daugherty, who was not in attendance at the conference, was submitted by mail.

SECOND SESSION (AFTERNOON OF MONDAY, MAY 21, 1923).

The conference reassembled at 2.30 o'clock p. m., Dr. S. W. Stratton, chairman, presiding.

SALE OF SERVICE ON THE BASIS OF WEIGHT OR MEASURE.

By R. F. Barron, *Commissioner of Weights and Measures, State of Minnesota.*

Mr. Chairman, Ladies, and Gentlemen: The word "service" occupies a considerable portion of space in all standard dictionaries and with its many applications affects a wide variety of our interests. Because of its various shades of meaning it is listed among the words that make the study of the English language difficult for a foreigner. When a church announces a devotional program, it is called a service; when a mortgage is not paid, the sheriff makes service of the foreclosure papers on the unfortunate delinquent; when war threatens, service to country is the one thought in most minds; in time of fire, flood, or famine our only idea is to render what service we can to the sufferers; and in case a scale or pump fails to pass the test applied by the inspector, the service man hastens to the rescue. All of these classes of service are at times discussed in terms of quantity; the church services are too long; the service of the writ is too soon; some even short measure in their service to country and fellow men; and we can recall a few instances where the measure of service rendered on faulty scales and pumps was less than it should have been.

Over these indefinite variations of the weighing and measuring idea we ask no jurisdiction, but there is one class of service that it would seem might well be considered as within the scope of the inspector's work. This class comprises such services as are offered to the public at a price per unit of weight or measure.

Going back to the origin of the weights and measures department in Minnesota we find that the penal clause of the statutes, following closely the wording of the model law approved by the annual conference, provides, in part that—

> Any person who shall offer or expose for sale, sell, or use or have in his possession a false scale, weight, or measure, or weighing or measuring device, or use the same in the buying or selling of any commodity or thing * * *, or shall sell or offer or expose for sale less than the quantity he represents or shall sell, offer, or expose for sale any such commodities in the manner contrary to law, * * * shall be guilty of a misdemeanor * * *.

Your attention is particularly called to the words *commodity or things*, for on their meaning as interpreted by the courts and attorney general the case must rest.

The law was enforced with gratifying success, inasmuch as prosecutions for violations of its provisions were almost invariably successful until the courts were called upon to listen to a complaint which involved this question of service, and the decision was adverse to the department. The occasion for the finding was a charge brought against a laundry concern which advertised and agreed to do family washings at a stated price per pound. Complaints to the effect that

the concern was charging for a greater number of pounds than was proper led to an investigation which disclosed that the patrons of the laundry were being grossly overcharged; in other words, there was in many cases a representation of a greater weight than was actually laundered. The prosecution followed, and the able attorney for the defendant established to the satisfaction of the court that no "commodity or thing" had been sold, contending that the sale was one of "service" not included in the provisions of the act.

Not being convinced by that decision, several other cases of similar character were brought before different judges with the same result, and the consequence is that up to this time we have no jurisdiction over this field of weighing and measuring activities. In addition to the laundry work mentioned, we have received well-founded complaints relative to the threshing of grain by the bushel, transportation of commodities by weight, excavating wells on a basis of cubic yardage, and cleaning rugs at a price per square yard. Other cases in point will readily occur to all of you. I understand that officials in some States, working under a similar law, have secured convictions in such cases, probably because the judges were more liberal in interpreting the statutes or because the novel point of the defense has not been raised.

Inasmuch as at that time, and, in fact, at all times since, the Minnesota department has had slightly more than twice as much work as it was possible to do, this field was temporarily passed in favor of what were then more pressing matters. Within recent years, however, the great increase in the practice of sending family washings to be laundered on the weight basis has led to a proportionate increase in the number of complaints relative to overcharge.

Without any hope of a favorable response, but with the idea of legislative action to remedy the trouble, the attorney general of the State was called upon to render a decision in two of the complaints which we had investigated. The answer covers the legal aspects of the case so thoroughly that I am giving it in full.

APRIL 29, 1921.

DEPARTMENT OF WEIGHTS AND MEASURES,
Old Capitol, St. Paul, Minn.

GENTLEMEN: You inquire if the following cases constitute violations of section 4616, G. S. 1913:

1. A contracts with B to have laundry work done at 6 cents per pound. A sends 22 pounds of laundry and receives a bill for 25 pounds at 6 cents, or $1.50, an overcharge of 18 cents.

2. A contracts with B to have a rug cleaned at 30 cents per square yard. A sends a rug 8 by 10 feet (containing a little less than 9 square yards) and receives a bill for $4.20, an overcharge of $1.50.

In my opinion it is doubtful if a prosecution under the provisions referred to would be upheld by the courts. What is really sold or offered for sale in either case is "service."

It is true that under some conditions and for some purposes "service" may be treated as commodity. It is also true that in one case the "service" is measured by the weight, in pounds, of the commodity upon which the service is rendered, and in the other by the area of the commodity in yards. But it remains "service," the weight and area being used only for computation.

Section 4616 is the penal portion of the statute relating to "weights and measures." The only phraseology touching the case seems to be "or shall sell or offer or expose for sale less than the quantity he represents."

The gist of this act is the prevention of the use of incorrect instrumentalities or the use of correct instrumentalities in an improper manner, in connection with the sale, or offering or exposing for sale of "commodities or things." (State *v.* Peoples'

Ice Co., 124 Minn. 308–313.) There is language in the case above cited, which, if the word "quantity" can be held to mean "quantity of service," would indicate that a prosecution might lie.

This provision is, however, the creation of a statutory crime. The courts are properly cautious in enlarging the meaning of penal statutes by construction, and I doubt if the court would go so far as to hold that "service," although computed on the basis of weight or measurement, is within the provision of the law.

Prior to the enactment of the 1911 law the elements necessary to constitute the offense included knowledge and unlawful intent on the part of the defendant. These elements were stricken out in the 1911 act, and "the things there penalized are mala prohibita, pure and simple, of which, in the contemplation of the law, intent to defraud or commit wrong is not an element." (State *v.* Peoples Ice Co., supra.)

This would seem to possibly present an additional reason for not extending the application of the law beyond its clear meaning. If a prosecution would lie in the cases presented, it would seem to lie in any case where the price or compensation is computed upon the basis of weight or measure; e.g., a contractor agrees to dig a ditch for a price per rod and digs 50 rods and turns in a bill for 100 rods; or the same situation with respect to cubic yardage.

The cases presented, if knowledge and unlawful intent can be shown to be present, may be subject to prosecution under the larceny statute, for obtaining or attempting to obtain money or property by false pretenses.

Personally I would like to see the matter tested in court, but until the statute has been construed by the courts the above is my opinion.

Very truly yours,

ALBERT F. PRATT,
Assistant Attorney General.

The suggestion that the only remedy lies in a prosecution under a larceny statute, which requires proof of knowledge and unlawful intent, might be worthy of more consideration did we not know from previous experience that it is practically impossible to furnish such proof in any weights and measures cases. The opinion, however, paved the way for the introduction of an amendment to the law, and at the recent session a bill was introduced so to amend the act of 1911 as to make it read as follows:

> Any person who shall offer or expose for sale, sell, or use or have in his possession a false scale, weight or measure, or weighing or measuring device, * * *, or shall use the same in the buying or selling of any commodity or thing, *or in the computation of any charges for services rendered on the basis of weight or measure*, * * *, or shall sell or offer or expose for sale less than the quantity he represents of any commodity, thing, *or service*, or shall sell or offer or expose for sale any such commodities in a manner contrary to law * * * shall be guilty of a misdemeanor.

This bill passed the lower house without opposition, but was caught with hundreds of other acts in the rush of the latter days of the session and was never reached by the senate. Still believing that it is just as important that the public should receive a fair weight on service as on sugar, the bill has been carefully filed away to await the next session, when it will be brought out, dusted off, and again presented to our legislators for their consideration.

Before closing I wish to say that it has not been my idea to convey the impression that all or an unreasonable proportion of the laundrymen are dishonest—far from it. We do not think that the percentage of fraudulent weights in that business is any higher than in other lines, which is to say that the vast majority of laundrymen are honest. Laundry work has been chosen for this discussion because of the general interest taken in the subject and because it offered a ready illustration of the class of service we had in mind. The honest laundrymen welcome the scale inspection and supervision because they realize that it brings to them an assurance of accuracy in their

business and a freedom from unfair competition that can only be beneficial, while at the same time it means a square deal to the public; and the accomplishment of these three objects, when all is said and done, is the final goal of weights and measures activities.

THE WEIGHING OF COTTON.

By J. N. Siren, Sr., *Inspector of Weights and Measures, State of Louisiana.*

Mr. Chairman and gentlemen: In my section of the country the weighing of cotton and the testing of the scales used for this purpose are very important functions of the work of the weights and measures official, since in Louisiana cotton is a very important crop, and the port of New Orleans ships many millions of pounds yearly.

Cotton in bales is weighed on a beam of the steelyard type, equipped with chains and hooks suitable for seizing the bales. The beam has detachable poises and is usually of 700 or 800 pounds' capacity. When in use, the beam is usually hung in a light but strong wooden framework equipped with downhauls, by means of which the beam may be raised, and the bale of cotton attached thereto may be swung clear of the ground and held in this position to enable the weighing to be made. The whole equipment may be carried about from place to place without much difficulty, and in practice it is often carried from place to place to facilitate the weighing.

In testing these beams they are set up in the frames in the manner in which they are normally used. Four 50-pound test weights are used as the initial load. These are placed on the hooks, the poise is placed on the scale, the beam and weights are raised and held in this position by means of the downhaul, and the degree of accuracy of the beam and poise determined at this load. An added weight test is then made. A bale of cotton is engaged in the hooks and swung clear, and its weight is carefully determined. The beam is then lowered and four 50-pound weights are placed on top of it. This total load is then raised and the weight ascertained. If the beam is correct, the weight indicated will be 200 pounds greater than the weight of the bale of cotton formerly determined, within the tolerance allowed on a load of 200 pounds.

By the means of this test we determine the accuracy of the beam over two portions of its range. It would be very difficult to use any other type of scale than this in the weighing of cotton. Were a dormant scale to be employed it would be necessary to place each bale of cotton on a heavy truck of known weight and wheel it across the scale platform. Such a method would consume more time than the one I have described above.

The Chairman. If there are no questions, we will pass to the next paper on "Fraudulent practices—How we discovered and eliminated them," by J. C. Tinkey, assistant chief inspector of weights and measures of the State of Ohio.

Mr. Holbrook. Mr. Tinkey was to be present this afternoon but he has not arrived as yet.

APPOINTMENT OF COMMITTEES.

The Chairman. The committee on resolutions will consist of Mr. Miller, of Indiana; Mr. Dinsmore, of Nevada; Mr. Roberts, of the

District of Columbia; Mr. Barron, of Minnesota; and Mr. Worden, of Highland Park, Mich. The committee on nominations will consist of Mr. Cluett, of Chicago; Mr. Schwartz, of New Jersey; Mr. Warner, of Wisconsin; Mr. Egan, of Connecticut; and Mr. Payne, of Monroe County, N. Y.

Is there any other business which comes before the meeting this afternoon?

(It was moved and seconded at this point that the conference adjourn. The question was taken, and the motion was agreed to.)

(Thereupon, at 3.45 o'clock p. m., the conference adjourned to meet at 10 o'clock a.m., Tuesday, May 22, 1923.)

THIRD SESSION (MORNING OF TUESDAY, MAY 22, 1923).

CITY AND COUNTY DAY.

The conference reassembled at 10.30 o'clock a.m. at the Bureau of Standards, Dr. S. W. Stratton, chairman, presiding.

The CHAIRMAN. This is the day set aside for the discussion of matters especially pertaining to local sealers of weights and measures, county and city sealers. You remember we decided last year to set aside a day for that purpose.

COOPERATION BETWEEN STATE AND LOCAL WEIGHTS AND MEASURES DEPARTMENTS.

By AUGUST LUTZE, *Sealer of Weights and Measures, Sheboygan, Wis.*

In Wisconsin, as perhaps in some other States, the statutes demand a certain amount of cooperation between State and city departments, and while this compulsory cooperation is really not interwoven directly with the subject assigned to me it may be in order to mention it, since it forms, to some extent at least, a stepping stone between the two departments.

The Wisconsin statutes require that the State superintendent of weights and measures shall issue regulations for the guidance of the sealers of weights and measures; that he shall prescribe the tolerances to be permitted on weighing and measuring devices; and, further, that he shall compare and verify the standards used and owned by the cities with those of the State.

On the other hand, the statutes of Wisconsin prescribe that the city sealer shall file a quarterly report, sworn to, with the State superintendent of weights and measures; and there is one very specific statute which demands immediate cooperation between city and State, and that is the law applying to the testing of milk bottles. If the bottles which have been tested are found to be in excess or deficiency of the required and prescribed tolerances, the law provides that this fact shall immediately be reported to the State superintendent of weights and measures.

As stated before, this cooperation is mandatory, and I mention it only with a view of leading over to the real voluntary cooperation which should exist between the two departments, and I shall endeavor to give you my ideals on that subject.

Webster defines the word "cooperate" as "acting or operating jointly with another or others; or to concur in action, effort, or effect." Cooperation, therefore, between State and local weights and measures departments should be everything that its meaning implies.

In speaking on this subject, I must necessarily confine myself to my own experience as a local sealer of weights and measures and in this manner try to convey to you the absolute necessity of the presence of the interlocking link between State and city departments. I have necessarily assumed that the State laws are such as would

empower the State and city departments to do the things that I outline.

I shall first present to you the cooperation a city has a right to and does expect from a State department, and then the cooperation a State department has a right to expect from the city.

There are four essential factors which a city looks forward to from a State department.

First. That the State depactment shall determine upon the qualifications necessary for the man who is to assume the responsibilities connected with the office of sealer of weights and measures.

Second. That the best qualified man be recommended by the State department to the appointive power, usually the mayor of a city.

Third. When the official has been named, the State department should train the man in his work.

Fourth. When the State department has satisfied itself of the reliability and capability of the new local official, it should keep itself informed as to whether the local official is keeping abreast of the progress and advancement of weighing and measuring appliances and weights and measures work.

Returning now to the first factor of cooperation expected from a State department, "that it shall determine upon the qualifications necessary for the man who is to assume the responsibilities connected with the office." This can easily be accomplished by the State department preparing the questions for the examination and, in addition to this, having a representative from its department conduct an oral examination of all applicants. The oral examination especially will prove a great factor in securing the best man. After having decided on the best qualified applicant he should be recommended by the State to the appointive power, this usually being mayor of a city.

The third factor speaks for itself. When the official has been appointed, the State department should take him in hand and train him. He should be trained to the customary uniform methods employed by the State in making tests and enforcing the law. Personally, I want to state that I am grateful to the State department of the State of Wisconsin for the training it gave me during the early period of my work. This training is the foundation upon which all future work will solidly rest, and a city which pays for this work has every right to expect it to be solidly founded and so bring about the desired results.

The fourth factor, "when the State department has satisfied itself of the reliability and capability of the local official, it should keep itself informed as to whether the local official is keeping abreast of the progress and advancement of weighing and measuring appliances and weights and measures work." This does not necessarily mean that the State have a man following up on a local inspector's work without knowledge of the latter; that would be dangerous. A State department should withhold no information from a city sealer as to his work. It should be open and frank in its criticisms as well as its commendations. It should at all times make the city official feel that it has no feeling of distrust toward him, but rather one of full confidence. With these relations established, there need be no doubt in the mind of a State department but that it will receive all the cooperation from the city sealer, which I shall refer to a little later.

It will be a fairly easy matter for a State department to note from the correspondence, reports, and other activities just what the local inspector is doing, how he is handling his work, and with what success he is meeting. A State department should never become vexed if a local man keeps its stenographers busy, but should be ever ready to lend him a courteous and willing hand, giving him the full benefit of all of its knowledge and experience. And, finally, the State department should call in, annually if possible, for conference all of the local weights and measures officials and discuss with them all of the problems which are always to be contended with in weights and measures work. Here will be the real opportunity for observation, and if the State department is satisfied from its observations it has then done its full duty of cooperating with a city.

The Wisconsin Weights and Measures Association, which meets at the State capitol annually, has been successful in bringing about the best of cooperation between State and city departments. Prior to its meeting the executive committee meets and draws up the tentative program, which, when decided upon, is turned over to the State superintendent of weights and measures for his approval. The program always represents subjects of vital interest to sealers of weights and measures, the subjects themselves usually being recommended by the latter. This means that all important problems can be properly presented and discussed. During this discussion the State department can make its observations as just stated and form its own conclusions as to the standard of efficiency being maintained by the city sealers.

The State superintendent after having approved of the program then shows his cooperation by sending out notices to the adminstrative heads of the cities, urging them to send their representatives to the conference, impressing the necessity of such attendance as an essential requisite to the successful operation of a city's weights and measures department.

So much for the cooperation expected from a State department. Now, let us consider the cooperation due the State department from a local sealer of weights and measures.

The local sealer of weights and measures nine out of ten times is an untrained man, a man without experience, and in most instances without technical or practical training. He has gathered all his knowledge of the subject from the laws of the State and the book of regulations issued by the State department. He has been permitted to avail himself of the privilege of securing all information as to the qualifications and work connected with the office by communicating with the State department and with their assistance has been able successfully to pass an examination and receive the position he has been desirous of obtaining. If for no other reason, out of common decency and respect he should be ready at all times to cooperate with his superiors.

He should be a careful observer when he receives his initial instructions and never deviate from them. Uniform methods of test and law enforcement are a great essential in the successful operation of his work, and this is the first factor in which the State department tries to educate the local official. If the local inspector finds a condition which puzzles him, he should not commit himself, either by

word or act, but consult his State department as to the proper course to follow.

We have often heard at conferences the remark, "If you have an unusual condition confronting you, use your common horse sense and decide it." I should reply to that, "Go for help to the man who has never let his horse sense run away with him, but has always applied it in such a manner that there could never be a 'come back.'" And this man is the State superintendent or his trained assistant.

I would like to relate to you an experience I have had to bear me out on the good which results from cooperation between State and city departments. In the early days of my work it happened that I had a prosecution and before the case was called my attorney called me aside and said to me, "Now Lutze, this fellow is ready to plead guilty, but he thinks the fine of $25 and costs a little too stiff, but he would be willing to compromise on $15 and costs. What do you think about this for a settlement?" I replied, "I don't know as it is within my province to compromise in this matter, but I'll tell you what I'll do. I'll call up the State superintendent of weights and measures and ask him what he thinks about it." And so it was agreed that I call up. When I got in touch with, or rather within speaking distance of the "venerable, young, old gentleman," who still at this time is in charge of our State department, in a clear, firm voice, he replied to me, "Mr. Lutze, it is your duty to enforce law, not make law. The matter of fine is up to the court." Well, I learned a real lesson right then and there. I gained a point with the court, and I have never since been placed in a position where I was asked to compromise. Not having established a bad precedent, there was no danger of it ever being used against me.

The local sealer should be a keen student and observer in the territory intrusted to him. It often is the case that within his particular territory there are certain manufacturers or other institutions using or manufacturing articles, machinery, or goods which play a prominent part in weights and measures work. He should make a study of these and inform and keep informed his State department as to his opinions and conclusions, so that they, in turn, may be in a position to advise others. In other words, let the State department be the "clearing house" for the solution of any and all problems which may arise.

I have always felt that after discovering some defect or discrepancy while engaged in mechanical or supervisional work it is a better policy to report defects or discrepancies to the State department than it would be to communicate with a manufacturer direct or with the local sealer of weights and measures in whose territory the article is made; and for this reason, if the defect or discrepancy is of a serious nature, the State department can bring immediately greater pressure to bear on the manufacturer or merchant than can the local sealer of weights and measures, and at the same time the State department can immediately notify, by circular letter, or otherwise, all of the officials within the State, and by having the cooperation of all the trouble can be eliminated in a very short time.

Let me cite to you just one instance of how this works out. A few years ago there appeared in one of our daily papers an editorial that it was rumored that, for some reason or other, the Michigan

grape growers were dissatisfied, and in order to gain their point they were going to ask the basket manufacturers to increase the thickness of the bottoms of the baskets. The first thing I did was to reply to this editorial, advising merchants and consumers of the regulations applying to this particular container, and the next thing I did was to advise the State department of the facts. In a few days I had a letter in reply advising me that this was first-hand information, and along with this letter came a copy of a letter addressed to the chief inspector of the State of Michigan, informing him of the facts and asking his cooperation in enforcing the law on this particular container. In checking up later on, when the fruit began to arrive, I found no baskets of illegal size, and while it may have been only a "newspaper flash" from the very outset, quick cooperation showed all concerned, that the weights and measures men were on the job.

And so, all in all, we come back to the application to our work of the definition of the word "cooperation"—acting and operating jointly with one another. Let there be at all times uniformity in action, effort, and effect. Strictly adhering to this principle, the State department will see a fulfillment of the work it has been intrusted with, and the local weights and measures department will discharge its duties to the satisfaction of the State department, and more particularly to that of the community, by which it has been intrusted with so important a task.

DISCUSSION OF ABOVE PAPER.

The Chairman. I want to say that the subject of this paper is a very important one. From the very beginning of this conference we have been very much interested in the relation between the State and the city sealer. In fact, we saw that in the end the State official would be the organizer and instructor of the city officials and county officials. This is an indication that you are thinking of that, and the subject is one on which we should have free discussion. Are there any remarks on Mr. Lutze's paper?

Mr. Egan. I would like to say in that connection that, as far as my experience goes, I feel it would be presumptuous on the part of the State sealer to indicate to the mayor of a city who his city sealer should be. I doubt if we would have much success in that line, especially in Connecticut. The authority to appoint the city sealer is vested in the mayor. They are independent of any State authority in that respect.

Mr. Lutze. Mr. Chairman, in Wisconsin we are entirely under civil service. All we have accomplished is because of that fact, because we have been able to work unhampered. No political machine can undermine our work, and we feel that to be an ideal condition. That is why I emphasized the recommendation as to appointment.

The Wisconsin law provides that applicants for the position of sealer shall take a civil-service examination; after this examination the State civil-service board furnishes the mayor a list of the three highest. Invariably the man chosen is the man who heads the list. I also stated in my paper that it was assuming that the city had a right to do it in the way I had outlined. It is merely an ideal on my part. I feel it to be as fair as possible.

Mr. EGAN. Mr. Chairman, I take no exception to this paper. I am only stating what I understand to be a common practice. In my own State I have in mind the appointment of two city sealers within the last six months or year, and there was no intimation from me as to who should be appointed. We have, however, advised mayors of cities of the importance and the value resulting from their officials attending these conferences. We volunteered that information with the feeling and idea that it was within his official power and authority to make the appointment. I can not recall that any mayor has neglected, when so informed, to urge the attendance here at this conference of the city sealer.

Mr. MCGRADY. Mr. Chairman, in relation to cooperation between the State and the city and county sealers, I may state that in Pennsylvania the law specifically states that all city and county inspectors of weights and measures shall be appointed by the respective mayors or county commissioners, but they shall all be under the jurisdiction and rules and regulations laid down by the bureau of standards of Pennsylvania. Quite frequently throughout the year questions arise on certain points that are referred to the bureau of standards, and we make a ruling on that particular point. In that particular we try to conform to the recommendations of the National Bureau of Standards, and we have hearty cooperation by having a uniform system.

Mr. MILLER. Mr. Chairman, we have a somewhat different arrangement in Indiana. We have civil service. The law requires that all candidates for appointment for city or county sealers must first appear before the State commissioners and take an examination in order to be placed on the eligible list. From this list the council of the city or board of commissioners of the county appoints the man, usually acting on the questionnaires. It does not necessarily appoint the man receiving the highest grade on the examination, but a man must be appointed from this list established by the examination given by the State commissioners. We have about 45 city and county sealers, and their cooperation has been very satisfactory. As was stated a while ago, most of these men after they are appointed are free from any restraint after they go into office, and they give good service.

Mr. HOLWELL. Mr. Chairman, in the State of New York we have, of course, a number of large cities. These cities have been granted a measure of home rule. All inspectors of weights and measures in these cities are civil-service appointees taken from the eligible civil-service list. In the city of New York, for instance, while we have practically complete authority in our work, I might say, for my own part we have at all times cooperated with the State sealer of weights and measures. There has been no jar or conflict at any time. Certainly the city and county officers have cooperated with him, and, as far as I can see, it has been very harmonious, and, speaking very decidedly in this matter, as the movement grows you will find that the duties of the State officer includes a great deal more than at present. I have always felt that the State officers will take up the more important commercial standards and some manufacturing standards, if they would be of maximum assistance; already I think there are some States now where they are testing thermometers and things of that sort. Standards of quality are steadily being taken

up and regulated; also, in the matter of governmental purchasing, the question of quality is an important one. The standardizing of quality will put competitive bidding on a sound foundation, and that is where the weights and measures officials will be called on to help.

Mr. GLOSTER. In Massachusetts we have an arrangement somewhat similar to that outlined in Mr. Lutze's paper. All cities and towns, by law, must have a sealer of weights and measures. When the jurisdiction has less than 10,000 inhabitants the civil service commission does not step in; but when the population is over that, selection by civil-service is compulsory, and there must be a competitive examination for the position. Whenever there is an eligible list already established some one on that list is chosen. An attempt is made to have at all times an eligible list, so that the sealers in Massachusetts are all under civil service in towns of 10,000 and over. The State inspectors are likewise classified by civil-service rating, so that politics does not enter in any shape or manner. Mr. Holwell spoke of clinical thermometers. Massachusetts will not allow them to enter unless they have received a test at the State department of standards.

The CHAIRMAN. There is a decided and growing interest in this matter.

THE ORGANIZATION AND CONDUCT OF CITY AND COUNTY DEPARTMENTS OF WEIGHTS AND MEASURES.

Remarks of WILLIAM F. CLUETT, *Chief Deputy Inspector of Weights and Measures, Chicago, Ill.*

In the city of Chicago we put our main efforts on the inspection of weighing and measuring apparatus used to weigh or measure foodstuff, dry goods, coal, hay and feed, building material, gasoline, etc. Our inspections are made at the stores or places of business where the apparatus is used.

In order better to systematize the inspection and testing of weighing and measuring devices used in the city of Chicago and the investigation of the accuracy of the weights delivered, the city has been divided into four districts.

We make no inspection of pharmaceutical balances and glassware, nor do we have specially assigned investigators for making any special tests with the exception of gasoline pumps and taximeters. While we appreciate the necessity of inspections of this character being made, the department is too short-handed to cover all lines of work.

We have 2 single wagons and 2 Ford trucks with 3 inspectors on each. Each vehicle carries twenty 50-pound test weights, one 25-pound, two 10-pound, and one 5-pound weights for testing the heavy-capacity scales. They also carry a small set of test weights running from 8 pounds down to $\frac{1}{16}$ ounce, 1 set of standard liquid measures from 1 gallon down to 1 gill, one 4-ounce glass graduate divided in drams, 1 standard yard measure, one 4-yard ribbon for testing fabric measuring machines, in addition to seals, tools, and other necessary equipment.

All scales, weights, and weighing and measuring devices are inspected and tested once annually, except scales of a capacity of 3 tons or over, which must be inspected once in each six months. Whenever

a scale or measure does not test out within tolerance it is marked "condemned" and the owner or user is told by word of mouth, and a printed notice is also left stating that the scale or measure is condemned and must be removed from the counter and no further use made of it until after it has been repaired, which must be done within 10 days from the date of condemnation, and our office notified that the scale is ready for resealing. In case the scale is replaced with a new one, this scale must be inspected and sealed by us before any use is made of it. We return after the expiration of 10 days, if we have not been notified to return earlier, and reseal or confiscate and prosecute where our notice has not been complied with. The men assigned to these districts test all scales and weighing and measuring devices used in their district, except taximeters and pumps used at filling stations and garages, which are inspected by specially assigned inspectors. In addition to their inspection work these men carry report slips, wherever they find a dealer using scales that are fast in balance, or packages of commodities put up in advance of sale that are short in weight, a report is made out and the dealer left a notice to report to the office to explain why the violation occurred.

We run four Ford cars with two inspectors in each who are assigned to certain districts to follow up and reweigh deliveries made by coal, hay and feed, and building material dealers, and vegetable, ice, and junk peddlers. These inspectors carry report slips, which must be filled out giving a detailed report of each weighing made by them. Whenever a violation of the weights and measures ordinances is found a card is left with the driver to be given to his employer instructing him to call at our office and explain the violation. If the violation is minor or technical, the dealer is let go with the explanation of the requirements of the ordinances and a warning against a repetition of the offense. If the violation is flagrant, a suit is commenced and the dealer is brought into court on a summons.

The deputy inspectors all have police power, but make no arrests unless it is a case of obstructing, hindering, or interfering with them in the performance of their duties, or where they find an itinerant peddler violating the ordinances who has no license and they can not be sure of the name and address given them being correct. An arrest is made under these circumstances. The inspectors also impound all necessary articles for use as evidence. An attorney's docket is kept in the office, giving all details in court cases and the disposition of same. These investigators are changed around frequently from one district to another in order that they do not become so well known to the drivers and dealers as to destroy their efficiency. Whenever discrepancies are found in weights of loads weighed over different scales a test of the scales is made before any suit is commenced. We also have two inspectors on foot who make purchases and investigations in stores. Where purchases are made in stores before any reweighing is done, the balance of the scale is noted, and if it is out of balance the scale is properly balanced before the purchases are reweighed. The weighing is done on the same scale originally used. Where the dealer has two or more scales, the balance of each is noted, and a comparative test is made by weighing some article on each of them. No test weights are carried by these investigators. A very complete and detailed system of records is kept by the department of every inspection or investigation made. In addition, a pamphlet contain-

ing a synopsis of the ordinances and a brief explanation of them is left with the dealers.

Equipment that we have found especially helpful in carrying out our inspection work is a revolution counter attached to gearing and a shaft operated by an electric motor used in proving the accuracy of taximeters and also a simple lever used in lifting weights in testing ice scales submitted to the office. For this work we had three 100-pound test weights made in order to give ice scales a capacity test.

We believe that the system we have inaugurated for the inspection and testing of apparatus and the follow-up system of purchases and reweighings with our detailed system of records affords protection to both the purchasing public and the honest dealer, and with additional help and equipment we could make the short-weight artist in Chicago as scarce as Irishmen in Jewish graveyards.

Remarks of WILLIAM FOSTER, *Sealer of Weights and Measures, Springfield, Mass.*

Mr. Chairman and gentlemen, I have been requested to contribute a paper outlining the procedure followed in conducting the department of weights and measures in the city of Springfield, Mass., and in compliance with that request I am pleased to submit the following:

The population of the city of Springfield at the last official census in 1920 was 129,513, and now is approximately 140,000; consequently the force in the department of weights and measures is small compared to a metropolitan city, although there are some cities of nearly the same size as Springfield where the force is nearly double the number in Springfield. Our force is composed of a sealer, two deputy sealers, and a clerk. Each of the deputies is furnished with a runabout automobile (Ford type) to carry all equipment for testing and sealing, with the exception of heavy-capacity scales, which include truck, team, and heavy-capacity dormant scales. These are tested and sealed early in the summer of each year, when an automobile truck is hired with a driver and helper to handle the test weights at the direction of the sealer or deputy. Later, inspections and tests are made from time to time as circumstances seem to warrant, and by that I mean that it is a well-known fact that some scales need more official attention than others.

The deputies' field equipment consists of 1 set of grip handle weights, composed of one 20-pound two 10-pound and one 5-pound weights in an oak carrying box; 1 set of cube weights, composed of three 2-pound, one 1-pound, and the fractions of a pound to one-sixteenth of an ounce; 1 set of nested liquid measures ranging from 1 quart to 1 gill; 10-pound capacity balance in carrying case, together with the numerous small tools, seals, etc., necessary for the work; and 2 or more 50-pound test weights. With this equipment the inspector is able to test any ordinary device in mercantile establishments or factories. No repairs outside of minor adjustments are made by any official of the department, and no charge other than the legal sealing fees are collected.

The work of sealing starts on January 1, and we mean to have the same completed by the close of the fiscal year, which is November 30. All records are kept in accordance within the fiscal year, which is from December 1 to November 30. A report of all work done during

the fiscal year must be in the hands of the director of standards of the commonwealth by December 10, and an annual report is also made to the mayor. For this latter, no definite time is fixed, but it is submitted during the month of December.

On January 1 advertisements are placed in the daily papers, in accordance with the statutes, and the work of sealing begins. One deputy is assigned to the wholesale district, covering all devices in said district, wholesale, retail, or manufactering, and the other deputy at the same time does the drug and jewelry stores all over the city from a list of locations kept for that purpose. When this work is completed, the work in the stores, markets, and manufacturing concerns is started. Using certain streets for boundaries, the deputies take street by street in the same general direction and cross streets intersecting them until the entire city has been covered. In addition, reweighing and inspecting is done at all times, such as peddlers, weighing of coal in transit, and reweighing of commodities put up for sale.

The gasoline pump has come to be one of the devices demanding a great deal of time and attention. The work of testing and sealing is done by beginning about the first of May and continuing until all have been completed. Frequent repairs, replacements, and new installations require almost constant attention. New installations are not sealed immediately after being completed, but are allowed to stand unused for a time after the mechanic has completed his work, thus giving the sealer an opportunity to observe whether or not there is a leakage to and what extent. These tests are made with standard measuring cans, graduated in the neck in cubic inches. A set of five cans is used, one can for each quantity the pump is designed to deliver. Sufficient tests are made at each quantity stop and at the capacity of the pump to satisfy the sealer as to whether or not the pump is delivering correctly and consistently. In sealing gasoline devices lead wire seals are used on all stops and other sealing points, secured by a seal press on which "S. P. D.," the official seal, is on one side and the year on the other side. At one of the sealing points, most conspicuous, an "approved" aluminum seal is used on which is stamped the official letters, the month and the year in this manner: "S. P. D. 5–23." This is attached with a lead wire seal as above described.

These aluminum seals are also used on all devices where paper seals would be impracticable, such as junk, ice, and vegetable peddler's scales, and we find it good policy to use them on truck, dormant, and portable platform scales, as the danger of their becoming detached is much less than with the paper seals. All metal seals are marked with the month and year, so that upon future inspections it may readily be determined when the device was last sealed. This also applies to paper seals, but, in addition, on the latter the name of the official who attaches the same is written in ink. The printing of the name of the official on seals should never be countenanced for the reason that they might be used by unauthorized persons if by any chance they should come into their possession.

In Massachusetts only seals previously approved by the director of standards of the Commonwealth may be used by any sealer. In paper seals the colors red and green alternate each year; red being

used in the odd numbered years and green in the even numbered years.

In accordance with the provisions of the statute, what are known as State standards are provided, consisting of a set of avoirdupois weights ranging from 50 pounds to one-sixteenth of an ounce; a set of dry measures ranging from one-half bushel to one-half pint; one set of liquid measures ranging from 1 gallon to 1 gill; one balance; one yard measure; the meter; the kilogram; and the standard troy weights and metric weights designated by the director of standards, which now consist of one set of each up to 2 drams and 50 grams, respectively. They are tested and sealed by the State department. Standards are used only for the purpose of comparing working equipment and are never used as working equipment. A record is kept of the dates of comparison of the working equipment with the standards. All working equipment is compared at least once each year, and some of it much oftener.

Each deputy carries in his kit what is termed a field book, numbered consecutively, beginning with number 1 on December 1 each year. These books are printed and numbered 100 pages in duplicate, with a place for the name and address, date, and place of business, kind of device sealed, and amount of fee for sealing. They are ruled in columns for adjusting, sealing, nonsealing, and condemning, amount of fee charged for each, total amount received, and remarks. The duplicates are printed on colored paper on which a carbon is used and are perforated, to be torn out and given to the party for whom the work is done, the sealer or deputy sealer signing the receipt for the fees, and also signing this statement: "This is to certify that I have this day tested, adjusted, sealed, or condemned the above-described articles, according to the provisions of law." Office books of the same style and makeup but numbered in a different series are used for the work done in the office. This method gives an account of the sealing work done daily by each deputy. When the book is filled, it is turned into the office, checked up and certified by the sealer, and then sent to the auditing department, approved, and returned to be posted in a permanent office record book capable of containing one or two year's work.

On the first day of each month the fees collected by the deputies are turned over to the sealer, and he in turn pays them to the city treasurer, at the same time notifying the city auditor of the amount so paid. This system while simple gives a complete check on both work done and fees collected, and at the close of the year the totals of each kind of device tested, adjusted, sealed, nonsealed, or condemned, and the total amount of fees collected are all on one page of the office record book in convenient form for use in making out the annual reports.

Records of inspections and reweighing of commodities, with the exception of coal in transit, are kept in much the same manner as the work above described. Small books of bound slips are numbered consecutively, size convenient to carry in pocket, ruled for date, name, commodity, etc. When these books are filled, they are turned into the office and are copied into a commodity reweighing and inspection record book. This book is a loose-leaf ring binder 9 by 12 inches with blank pages tab indexed for each commodity, such as bread, flour, butter, etc., thus bringing the reweighing of each article on a

separate page or pages, so that at a glance one can see how many reweighings of any commodity have been made and what the result showed.

For reweighing coal in transit a special duplicate, consecutively numbered book, 4 by 7 inches is carried by the official. It is printed and ruled for each item of information, such as names of sellers, purchaser, driver, weigher, copy of weight certificate, weight stated on certificate, and weight found on reweighing, gross, tare, and net, time of weighing, and scale where reweighed. This information is copied into a permanent office record book kept for this purpose in which the reweighings of each dealer are kept on a separate page with all the details of each reweighing, thus enabling the sealer to check up at any time on any dealer he may desire.

A record of all special calls for sealing are kept in a book especially designed for the purpose with 100 white and 100 colored pages numbered in duplicate. Each sheet is ruled and partially filled in with the date when the call is received, the name, address, kind of device to be tested, name of deputy it is referred to, and the date of reference. The colored slip is given to the deputy who makes the inspection and he returns the slip to the department stating what he has done, with the date and his signature. This gives a complete record of all such calls from the time received until completed. Last year we had 560 special calls. I might say that these were largely necessitated by new installations of gasoline pumps and scales, put in privately before we went over the territory, as the merchants had been notified that in case of the installation of any new pumps or scales they were supposed to let us know and we would send a man out to the job.

Like all weights and measures departments a number of complaints of various natures are received. These are all recorded in a loose-leaf record book which is kept for that purpose. The advantage of using a loose-leaf book is that the pages can readily be removed, typewritten, and replaced as the case develops. All information received with the complaint, together with all the facts obtained upon investigation, including what action, if any, is taken in disposing of the complaint, and, if no action is taken, the reasons therefore, are recorded in the book. All complaints are treated as confidential if the party making them so desires.

As you all know there are many matters to take up the attention of the sealer which I have not touched upon here, but I trust that what I have said will be of some benefit to this conference.

Remarks of CHARLES M. FULLER, *Sealer for Los Angeles City and County, Calif.*

In order that you may better understand our plan of organization, let me first state that we perform all weights and measures work in 41 incorporated cities and towns, covering a population of over 1,300,000, located in an area of 4,067 square miles. This territory is divided into 24 inspection districts or zones. A pair of inspectors is sent into a district on general inspection work, with instructions to test all weighing and measuring devices, with the exception of gasoline-measuring pumps and heavy-capacity scales. These are handled by separate crews. The following time a different pair of inspectors will work this district. This keeps the mer-

chants from becoming too well acquainted with any certain inspector, and also means that if one inspector were inclined to overlook something it would surely be discovered the following year.

The inspectors or deputies are classified into two general groups—senior deputies and junior deputies. A senior deputy has had the necessary training and experience, so that he is capable of handling any problem that may arise in general inspection work. He also understands securing evidence and presenting it in court in case of a prosecution.

New men are taken in the department as junior deputies. These men work with the senior deputy, who is held responsible for the work of the team. After these men gain the necessary experience and training they are eligible to take a promotional examination whenever a vacancy arises in the ranks of senior deputies. In this manner we lay a firm foundation for a department of experienced and matured men who will make a life work of the service. All members of the department are under civil service and are appointed only after examination.

This being a specialized age, we find that greater efficiency can be obtained by training certain of the inspectors for certain lines of work. For example, there are over 4,000 gasoline-measuring pumps and devices in this territory. Inspectors who spend all of their time on these devices become expert in locating trouble and in making many small adjustments, which render it unnecessary to tag the device "out of order," thus saving the time and expense of a return trip. If the device needs only an adjustment on the rack rod, he is able to make a measurement and set it the exact amount, while an inspector who is covering all lines of work would be far more liable to set it correctly only after several efforts and tests. The outfits carried by these inspectors consist of a complete set of test measures ranging from 1 to 5 gallons, with gauges on the side for determination of the error, together with all necessary small measures and tools for adjusting and sealing.

All heavy-capacity wagon and autotruck scales are handled by an outfit working with a truck which is equipped with a crane for unloading the weights and a small iron wagon for shifting them from one corner to the other on the scale. We also use a two-wheeled trailer with an underslung iron box full of test weights, which is kept standardized at 2,000 pounds.

One outfit is kept busy taking care of special calls and checking back on red tags which become due. In this way the men who are on regular inspection work are able to "hit the ball" from morning until night in their respective districts without spending part of their time on odd calls which would have a tendency to slow them up. In the old days when I was working in the field we would have "hurry" calls which would "kill" the work of the day; we could not get our regular work completed that day. Now our men are able to work from morning to night without interruption.

The inspectors make memorandums of any suspicious occurrences or places which will bear watching. These are kept in a special file and visits or test purchases are made at unexpected times. This has resulted in many worth-while prosecutions.

The above suggestions are offered in the belief that, inasmuch as they have proved practical in our organization, they may be useful to you.

Remarks of GEORGE B. MOORE, *Sealer af Weights and Measures, Allegheny County, Pa.*

Mr. Chairman and gentlemen, I have been selected, as a representative to this convention from the county of Allegheny, to read a paper, and I want to say that I consider it a very great privilege to do so at this time. The subject which has been assigned to me is "Weights and measures in the county of Allegheny." The bureau of standards was organized in November, 1911, provided with the necessary standard equipment and a corps of trained inspectors with a view of obtaining a square deal for the housewife in her purchase of household commodities, to encourage the merchants in the use of reliable and accurate weighing devices, and punish the dishonest dealer.

Our duties being manifold, our initial campaign was directed toward the elimination of inferior and mechanically inaccurate devices, but owing to the existing laws we could not condemn certain kinds of scales which, when new, would stand the inspector's tests, but when in service for any length of time would invariably defraud either the consumer or dealer. This has been obviated by the enactment of new legislation, which gives the Pennsylvania bureau of standards power to approve or disapprove all weighing and measuring devices to be sold, offered for sale, or given away after May 5, 1922, in the State of Pennsylvania.

With these faulty, inferior devices eliminated, the city, county, and State inspectors of weights and measures can broaden their activities into many fields pertaining to weights and measures that heretofore have only been gone over roughly, owing to the routine physical inspection of the aforementioned types.

The use of false and insufficient weights or measures in the State of Pennsylvania, of which Allegheny County is a part, is prohibited by an act of assembly which I shall now read:

> Each person who shall, directly or indirectly, or by his servant or agent, or as the servant or agent of another, violate any of the provisions of this act, or give or offer to give any false or insufficient weight or measure, or use any weighing device after it shall have been condemned and before it shall have been adjusted and sealed, or obstruct or attempt to obstruct any inspector in the performance of his duties, shall, upon conviction thereof in a summary proceeding before any alderman, magistrate, or justice of the peace of the proper city or county, for the first offense, be sentenced to pay a fine not to exceed twenty-five dollars; for the second offense, shall be sentenced to pay a fine not exceeding fifty dollars; and for each subsequent offense shall be sentenced to pay a fine of not more than one hundred dollars, or to undergo an imprisonment in the proper county jail for not more than thirty days, or both, in the discretion of the court. In default of the payment of any fine as aforesaid, the person convicted shall be sentenced to serve one day in jail of the proper county for each dollar of the fine and costs.

Now, gentleman, it is laws of this kind, if properly enforced, that will eliminate the dishonest dealer, and I want to say right here that in my county we have lived up to this act and have rigidly enforced it. I might state that when our department was first organized we started out with 2 inspectors, but soon found it was impossible to cover the county in a proper manner with this force, and we have since increased it to 10 men, who are at all times on the job. We have a 1-ton truck with 2 inspectors on it who take care of all the large platform and coal scales. We also have 3 runabouts with a

crew of 2 inspectors on each. One crew takes care of all automatic gauges, and the other 2 crews look after the small scales.

During the early history of our department we had quite a lot of trouble with the hucksters, and at that time we gave a great lot of our time to eliminate this menace, and at the present time I can quite truthfully say that we have one of the cleanest counties in the State of Pennsylvania, in so far as hucksters are concerned.

We also had a lot of trouble with the butter that was put up in prints, but after a few prosecutions and fines the butter started to gain some weight, and at the present time we are having very little trouble with it.

One thing more I might add. It is essential that the department of weights and measures have the cooperation of the county commissioners. They must stand back of the department in its prosecutions and enforcements. If they do not do this, the department will lack that initiative which produces the morale, and then your department will not reach a 100-per cent basis. The county commissioners of Allegheny County stand back of us in every move we make. Time after time those whom we had prosecuted would come to them and try to induce them to interfere, but at all times they received the same answer, namely: "See the chief of the department, and if he thinks you are being persecuted I am sure he will see that you receive fair treatment." This is what helps to make the department as efficient as it is, and I will say that at the present time it is 100 per cent.

In the city of Pittsburgh, which is part of Allegheny County, we have a department of weights and measures which is under the able direction of Murray Livingston, who has a force of seven inspectors. Two of his crews do the general inspections which take in all small scales. One crew follows up these men to ascertain whether or not scales have been tampered with after being adjusted and sealed by the former. We also use this latter crew to test out packages, etc., and in so doing find that we get good results.

There are in the city of Pittsburgh at the present time about 225 gasoline stations, averaging four pumps each, and in the county of Allegheny, not including Pittsburgh, there are about 1,500 pumps, but we have very little trouble with these. We are obtaining good results from the inspections of gasoline pumps. When I assumed charge of the department some six years ago, the gasoline pumps at that time were about 90 per cent wrong. Since then we have increased the efficiency 70 per cent. The trouble at the present time is caused almost entirely by leaking foot valves. There are also in the city of Pittsburgh approximately 12,000 places where measuring and weighing devices are being used. In the county outside the city of Pittsburgh there are about the same number, so you can readily see that we have enough to keep us busy throughout the year.

One other thing that I might state in behalf of Mr. Livingston and myself is that we do not insist upon our inspectors doing more than a day's work during the hours in which they are on duty. We consider 22 visits each day sufficient, and by working in this way it gives the men a reasonable amount of time to make such adjustments as are necessary and does not rush them; therefore, we get results. I would advise you men who have a force of inspectors under you

to try this system out, and I am sure you will get the same results that we do.

Mr. Livingston's department has been selected by the mayor and the council of the city of Pittsburgh, and they have always stood back of him and cooperated with him in every way possible.

I might close by saying that Mr. Livingston and myself have two of the most efficient departments of weights and measures in the State of Pennsylvania. Gentlemen, I thank you.

The CHAIRMAN. You have heard these four papers. Are there any further questions or discussions of this paper or of the three preceding ones?

BUREAU OF STANDARDS INVESTIGATION ON COMMERCIAL FILLING OF MILK AND CREAM BOTTLES.

By RALPH W. SMITH, *Bureau of Standards.*

You will recall that at the last conference the question of the filling of milk bottles was raised, and an investigation on the part of the bureau seemed to be indicated to bring out the facts as to the commercial methods being followed in different parts of the country.

Naturally the first step in the investigation was to develop a method of measuring the commercially filled bottle to determine the height of the liquid level. The obvious method of removing the cap and measuring the height of the liquid below the cap seat could not be followed in the field because of the danger of contaminating the milk. What we desired was some method by which the height of the liquid level could be determined by an examination of the bottle as delivered, with the cap in place, using a scale of some kind applied to the outside of the bottle, reading across the height of the liquid level and determining directly the distance of that liquid level below the cap seat.

As we proceeded in our investigation we found that the ordinary straight steel scale was not entirely satisfactory. Gradually we developed a special gauge, consisting of a graduated scale with the upper portion curved so as to hook over the top of a bottle and rest on the cap. The zero mark on the graduated scale coincided with the level of the cap seat when the gauge was in place, and the graduations were spaced 0.05 inch apart. A thumbscrew near the bottom of the gauge was used to adjust the instrument to a vertical position.

We made a large number of preliminary determinations with this gauge and checked the results by the use of a depth gauge. We found that the observations taken with the special gauge compared very favorably with the check readings taken with the depth gauge, and that they could be made very quickly and with a minimum of effort and loss of time. The special gauge was therefore adopted as the basis for our field investigation.

The purpose of the investigation, as stated before, was to determine as nearly as possible the point to which milk dealers were filling their bottles. We made surveys in the cities of Chicago, Philadelphia, New York, and Washington, in the course of which we examined quarts and pints of milk, and quarts, pints, half-pints and gills of cream. In a few of these cases we had only a small number of any one kind of bottle so that in these cases our results can not be said to be truly representative. That is true in the case of the quarts of

cream of which we found only a very limited number. The quarts and pints of milk, of course, were very common, and the half-pints of cream were fairly common. The following table summarizes the results of the investigation:

Summary of results of investigation on filling of milk and cream bottles conducted by Bureau of Standards in Chicago, Ill.; Philadelphia, Pa.; New York, N. Y.; and Washington, D. C.

City.	Total number of bottles.	Average distance of liquid level below cap seat.											
		Milk.				Cream.							
		Quarts.		Pints.		Quarts.		Pints.		½ pints.		Gills.	
		No.	Average distance.	No.	Average distance.	No.	Average distance.	No.	Average distance.	No.	Average distance.	No.	Average distance.
			Inch.		*Inch.*		*Inch.*		*Inch*		*Inch.*		*Inch.*
Chicago, Ill	600 (13)	274 (13)	0.19	239 (12)	0.16	....	.....	....	.....	87 (9)	0.24	....	.....
Philadelphia, Pa	664 (12)	344 (12)	.28	313 (12)	.22	....	.....	....	.....	5 (1)	.23	2 (1)	0.21
New York, N. Y	883 (9)	615 (9)	.26	259 (8)	.20	2 (1)	0.44	....	.....	7 (2)	.44	....	.....
Washington, D. C	1,463 (12)	406 (12)	.22	847 (12)	.20	1 (1)	.58	10 (1)	0.39	177 (12	.25	22 (3)	.28
Total bottles	3,610 (46)	1,639 (46)	.....	1,658 (44)	.....	3 (2)	.....	10 (1)	.....	276 (24)	.....	24 (4)	.....
Average by bottles	.....	.....	.24	.....	.20	....	.49	....	.39	.....	.26	....	.28
Average by dairies	.....	.....	.24	.....	.20	....	.51	....	.39	.....	.26	....	.28
Average by cities	.....	.....	.24	.....	.20	....	.51	....	.39	.....	.29	....	.25

NOTE.—Figures in parentheses indicate number of dairies.

It will be observed that the average results obtained by three different methods of calculation show remarkable agreement. Whether averaged by bottles, by dairies, or by cities the results for quarts and pints of milk are, respectively, identical, and the figures for the two sizes differ by only 0.04 inch. The results for cream are based upon a very much smaller number of bottles, but here, too, the results are remarkably uniform.

As you know, this conference has gone on record as recommending that the capacity of a milk or cream bottle be determined by a point one-quarter of an inch below the cap seat. The results given in the table above entirely justify this recommendation.

It may be said that, in our opinion, the general practice of filling bottles to a point averaging one-quarter inch below the cap seat is not due to any desire on the part of the dairymen to defraud their customers. It is practically impossible to fill these bottles entirely full and market them successfully. Any rise in temperature will cause the milk to expand and if a bottle were entirely filled this would result in the frequent raising of the cap following temperature changes and contamination would be very apt to occur. Again, the machines used in filling these bottles do not normally fill them completely full and if they did do so spillage would almost certainly nullify this complete filling before the bottles were capped. A further factor is the unavoidable mixture with the milk of a certain amount

of air during the filling process, which air later separates from the milk and forms an air space in the neck of the bottle after it has stood undisturbed for some time.

All of these facts point to the necessity for calibrating bottles to a point slightly below the cap seat, and from the results of the bureau's investigation one-quarter inch below the cap seat is indicated as the proper point. This will result in the average delivery of full measure to purchasers of milk and cream.

DISCUSSION OF ABOVE PAPER.

Mr. MARONEY. What would one-quarter inch in vertical height represent in terms of cubical contents?

Mr. SMITH. On an ordinary bottle with a neck of an internal diameter of $1\frac{3}{8}$ inches one-quarter of an inch in vertical height is equivalent to 0.37 cubic inch, or 0.20 fluid ounce, or 1.6 drams.

Mr. MARONEY. As I understand it, they fill the bottles as full as possible, but when the milk, which is agitated in the machine, settles there is that discrepancy.

Mr. SMITH. There is some air included in the milk, and that will rise to the top. I might say that we did not examine these bottles at the dairy, but took them in the retail stores in the exact way in which they reached the consumers.

Mr. MARONEY. I wanted to bring out the point as to whether it was with malice aforethought or whether it was air separating out of the milk that caused that condition.

Mr. SMITH. We did not find anything to indicate that any of these distributors were trying to short fill their bottles. It results from the fact that commercial filling machines will not completely fill the bottles, and also it is probable that air is originally entrapped in the milk. It is a result which arises from conditions which can not reasonably be overcome.

PRESENT STATUS OF NEGOTIATIONS TOWARD OBTAINING UNIFORM REGULATIONS FOR MILK BOTTLES.

By F. S. HOLBROOK, *Bureau of Standards.*

Mr. Chairman, this subject of uniform requirements for milk bottles was brought up at the last annual conference by manufacturers of milk bottles, who said that there was at the present time no uniformity in the requirements in relation to milk and cream bottles in the various States of the Union, and as a result it required them to keep on hand very many more molds than would otherwise be necessary, with an increased expense of the bottle to the dairyman as a result. They sought some means by which uniformity could be procured.

Several months after the last annual conference a conference was held with the milk bottle manufacturers and with the dairymen in an effort to find how this uniformity in bottles could best be brought about.

At that time manufacturers stated that they were perfectly willing to make a bottle to hold its capacity when measured to a point a stated distance below the cap seat, or when measured to the cap seat, but they did not desire, if it could be avoided, to make both types of bottles.

At the first conference the dairymen were of the opinion that the bottles were filled full under present commercial practice. It was the decision of this conference that data be collected on this point. In accordance with this agreement the bureau then conducted the investigation which Mr. Smith has described; and a second meeting was held with the interested parties at which the results obtained were presented.

The subject at present stands thus: The manufacturers are still willing to make a bottle which holds its correct capacity to the cap seat or to one-quarter of an inch below the cap seat; and the milk and cream distributors have not as yet had a proper opportunity to obtain the consensus of opinion of the industry in relation to the matter. The secretary of the International Association of Milk Dealers has invited your secretary to appear upon the program of their next annual convention, which will be held in the city of Syracuse, N. Y., and present the subject to them.

The conference went on record some years ago to the effect that one-quarter of an inch below the cap seat was the proper filling point. Our investigation seems to have demonstrated that we did almost better than we knew, since we came within one-hundredth of an inch of the results recently obtained, representing the commercial filling of the average quart bottle of milk. It seems, then, that the conference recommendation is a proper one, and that no action need be taken upon this subject by this body. If we can convince the distributors that our attitude is correct, then we will have full cooperation in endeavoring to obtain throughout the United States a milk bottle which is correct when measured to one-fourth of an inch below the cap seat.

As Mr. Smith has brought out, no fraud seemed to be involved. There may be minor instances where bottles were not filled as nearly full as they might be filled, but, in general, it may be said that it was clear that the bottles were not being underfilled intentionally. However, it seems to be demonstrated that with the best filling apparatus available at the present time there will be a quarter of an inch air space between the cap seat and the level of the milk or cream, and it seems that it is very advisable to have that air space, as a matter of fact. Otherwise, as Mr. Smith has pointed out, the slightest expansion of the milk would result in the raising of the cap and the probable contamination of the milk through its flowing over the cap.

It is a fact, however, that at the present time milk and cream are constantly being delivered short measure when sold in bottles holding the correct capacity only when measured up exactly to the cap seat. It is a fact, also, that that shortage is a small one. However, it is greater in all cases than the average tolerance allowed on milk bottles and in the case of the smaller bottles is two or three times as great. Fortunately, the subject seems to be in a fair way of being solved.

I think the distributors feel differently about the matter than they did at first. They considered, without investigation, that the bottles were full because they were trying to fill them. As common practice does not result in the filling of the bottles it does seem reasonable to require the bottles to be correct up to the point at which they will be filled in commercial practice.

PROPOSED METHOD FOR TESTING MILK AND CREAM BOTTLES.

By E. L. Peffer, *Bureau of Standards.*

The accuracy with which the capacity of milk bottles can be determined is dependent upon (1) the accuracy of the determination of the volume of the liquid placed in the bottle when filled, and (2) the determination of the position of the surface of the liquid when it reaches the predetermined point. These two factors can be controlled within certain limits by means of the proper standards of volumes and by the use of a suitable depth gauge.

The method employed, to a large extent in your work, is that of using the standard slicker plate measure and a glass graduate to take care of the excess or deficiency. This, of course, in common with any other method, necessitates that the equipment be made up of a number of standard measures equal to the various capacities of the bottles tested, or the use of a measure a multiple number of times its nominal capacity. While this latter method of procedure may be employed it is hardly to be recommended, since in this case the error due to the manipulation is similarly multiplied. This is very undesirable, and the use of the ordinary measure of a capacity other than that of the bottle under test should be avoided.

I might say that in the case of a pint liquid measure the difference between the amount of water delivered and the amount contained is about 0.04 of a cubic inch, or approximately one-eighteenth of the tolerance on an individual pint bottle.

The method suggested when these measures and graduates are used is as follows: Fill the measure with water and place the slicker plate thereon, using precautions so that bubbles do not appear. Then pour the water into the milk bottle until it is nearly full. Pour the water remaining in the measure into the graduate and continue the filling until the predetermined point on the bottle is reached. The amount of water remaining in the graduate is the error in deficiency of the bottle. If enough water is not contained in the graduate to complete the filling, the bottle is in excess of capacity and more water must be added. This can be done by filling the graduate to some graduation mark and noting this quantity; then complete the filling of the bottle, and again note the reading of the graduate. The difference in these two readings is the amount the bottle is in error in excess.

In our testing—that is, in the laboratory testing—of bottles we find the depth gauge shown here to be very satisfactory. This portion [indicating] is made so that it will slide up and down, and you can read directly from the graduated portion the depth of the level surface of the liquid, or you can fasten the slide at a predetermined point and utilize the gauge to assist you in filling successive bottles up to this point. By the use of a gauge of this type the level of the water surface can be accurately brought up to a desired predetermined point by filling the bottle slowly until the surface of the water just touches the point of the gauge. This piece of apparatus can also be used to measure the distance from the cap seat or stopple to which a bottle has been filled with milk. This may not be done very often, but it is certainly worth consideration in obtaining information as to the closeness of the filling to the cap seat that occurs in prac-

tice. However, this would necessitate the opening of the bottle, which, as Mr. Smith said, is objectionable.

The type of apparatus proposed for use in the office or laboratory testing of milk bottles is made up of a suitable laboratory stand, clamps, reservoir, burette, and the necessary rubber tubing. These different parts of the apparatus can readily be distinguished. The burette is made up of a bulb, a graduated tube, the necessary stopcocks, and an overflow portion that contains the automatic setting (zero point) and also provides an outlet for the surplus water in filling.

This burette has a delivery of 1 pint of water from the overflow tip (zero point) to the capacity mark (1 pint) on the graduated stem. The stem is graduated on each side of the "1 pt." mark, so that the plus or minus error in the capacity of the bottle tested can be determined by direct reading.

In the use of apparatus of this kind a suitable reservoir is essential, as the burette is filled by gravity to the overflow point, which, as before pointed out, is the zero setting on the burette. The proper stopcock is then opened so that the water flows into the bottle until the filling, as indicated by the setting of the depth gauge, is completed. The error either in excess or deficiency of the capacity of the bottle is then read directly from the position of the water meniscus in the graduated stem.

For rapid and most satisfactory testing of milk bottles the equipment should be made up of a set of burettes of the various capacities, or some multiple thereof, as in the case of the standard measures. However, if the pint size burette is used to test quart bottles the error due to the refilling of the burette will be less than in the case of the capacity measure, as the burette is calibrated "to deliver" and the reading of the water meniscus in the graduated stem of the burette will probably be more accurate than in the graduate on account of the smaller diameter of the former.

This equipment, on account of its being more fragile than the standard measures, may not be very convenient for use in field testing, but as laboratory equipment it is susceptible of an accuracy that makes it worthy of consideration.

In the testing of bottles by the use of this apparatus a background of white paper is very helpful in bringing the meniscus out clearly. The reading of the water meniscus on any graduated tube is made easier and more accurate by the use of a "collar" or shade placed around the graduated portion immediately below the graduation mark. The gauge mentioned previously in this paper is to be used with this apparatus as well as in the other method.

The delivery time of the burette can be so adjusted that the time required to test a bottle by this method is equal to or less than that required by the use of the standard measure. When consideration is given to the accuracy of the results obtained by this method and to the fact that often the rejection of a "lot" of bottles is dependent upon the tests of a certain percentage in the lot, the expense of fitting a laboratory with this apparatus may be considered justified.

The apparatus will remain on the table for inspection by interested parties. A few blue prints are also available showing details of a bulb burette.

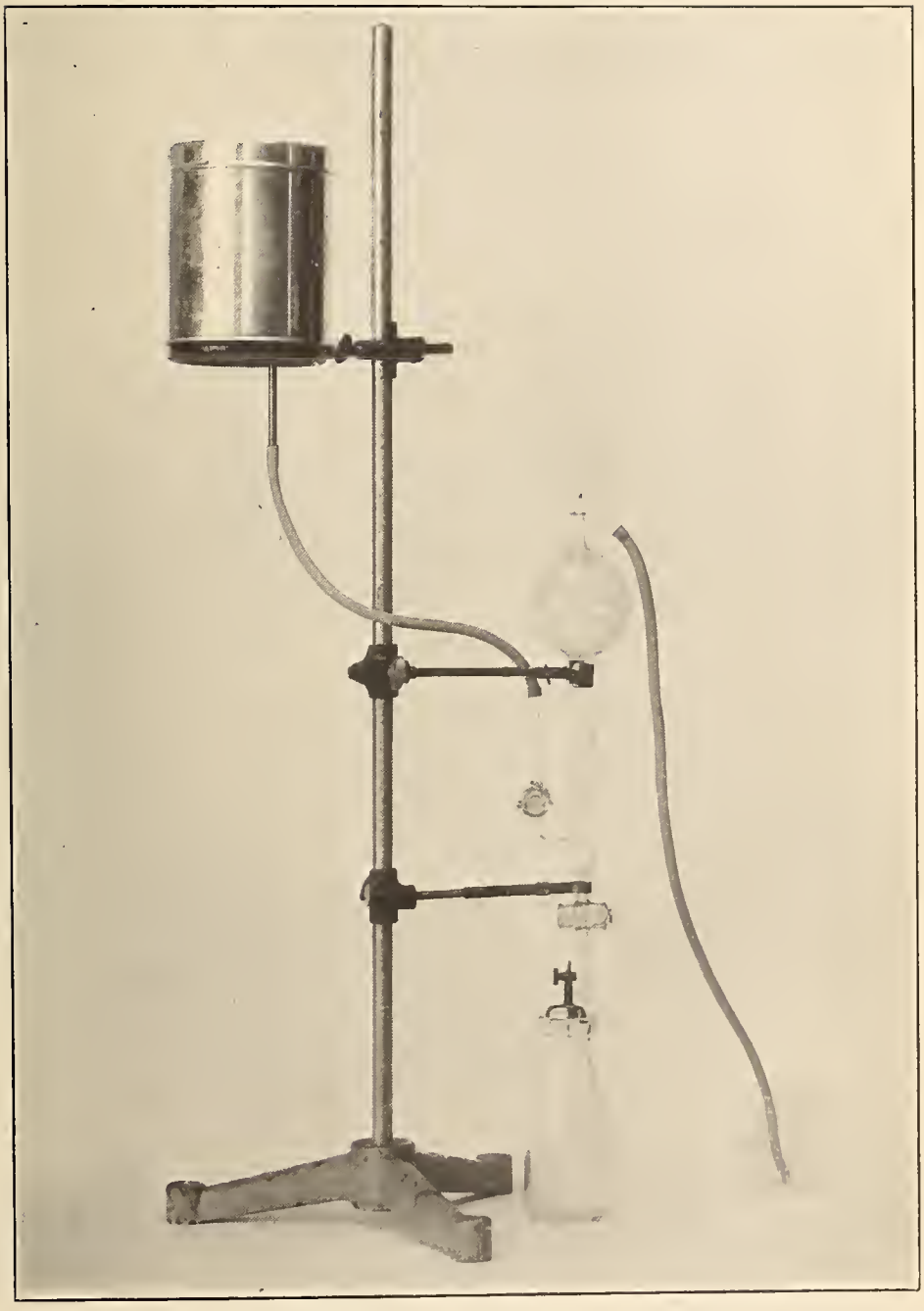

FIG. 1.—*Bulb burette for testing milk and cream bottles.*

Illustrating method of mounting burette and placing of testing gauge.

DISCUSSION OF ABOVE PAPER.

Mr. DALE. I would like to ask Mr. Peffer if, instead of his laboratory tests, it would not be possible and preferable and simpler to fill the bottle and then weigh it and reduce the weight to the capacity?

Mr. PEFFER. In answer to that I would say that while the weight method could be employed we found that the method described resulted in a saving of time.

ANNOUNCEMENTS.

Mr. HOLBROOK. Mr. Miller, chairman of the resolutions committee, has asked me to announce a meeting of the resolutions committee directly after the morning session in this room. He desires all members of the conference who have resolutions which they desire to have considered to present them to some member of the committee before that time.

I may also say that the report of the committee on specifications and tolerances on specifications and tolerances for vehicle tanks used in the sale of gasoline has been prepared and copies are available for such members as desire to familiarize themselves with this material before it comes up in regular order. It is possible that that may be called up this afternoon if the business is not such as to occupy the whole session. Any person desiring copies may help himself as he goes out.

(It was moved and seconded at this point that the conference adjourn; the question was taken, and the motion was agreed to.)

(Therefore, at 12.35 o'clock p.m., a recess was taken until 2 o'clock p.m.)

76317—24——4

FOURTH SESSION (AFTERNOON OF TUESDAY, MAY 22, 1923).

CITY AND COUNTY DAY.

The conference reassembled at 2 o'clock p.m., W. B. McGrady, second vice president, presiding.

TEMPERATURE AS A FACTOR IN THE MEASUREMENT OF GASOLINE.

By Howard R. Estes, *Sealer of Weights and Measures, Flint, Mich.*

The use of gasoline as a motor fuel has increased to such an extent in recent years that its sale has become a very important factor in commerce. It has been estimated that each of the 10,000,000 motorists in the United States buys 2 gallons of gasoline daily. The sale of this amount of gasoline means the transaction of approximately $5,000,000 of business in the retail trade of gasoline every day.

Organizations of production, refining, transportation, and sale have been created and are constantly being expanded to meet the ever-increasing demand. Although mentioned last, yet by no means least in importance, are the sales agencies—the filling stations in particular. Behind these are millions of dollars invested in property and in instruments of measurement to facilitate the convenience and correctness of sales transactions. Gasoline measuring device concerns are spending much money in research in order to perfect their particular instruments, so that both the buyer and the seller may be protected during the sale.

It is easily seen that large sums of money have been, and are being, expended to insure correct measure. Yet with all these expenditures we have been neglecting a most important factor in gasoline measurement, namely, contraction and expansion due to temperature changes. This is one of nature's forces, powerful in effect, constantly at work on practically every substance, and, if not accounted for, destroying to a large extent in the case of gasoline this accuracy of measurement which we are largely responsible for and for which large sums of money are being spent.

The factor of change of length and volume due to temperature change is met with every day. In every measurement of exactness in scientific work it is taken into consideration and due corrections made. For example, in testing steel tapes, if any degree of accuracy is to be arrived at a standard temperature must be used or observations corrected to a standard temparature. This is done here at the Bureau of Standards by comparing the standard with the unknown with both immersed in a bath of ice and water, thus insuring a constant temperature. In testing cream by the well-known Babcock test method some State laws and regulations make it necessary to recognize the principal of contraction and expansion by having the readings made at a certain fixed temperature because the glassware is calibrated at that particular temperature. The test is not what

might be called a very exact test either, yet the effect of the temperature must be taken into consideration.

When a refiner sells a tank car of gasoline, it is the custom to allow for the change of volume due to the variation of temperature from the standard. This applies, at least, to those shipments that have been investigated. It should be stated that the specific gravity of gasoline is corrected to the standard temperature of 60° F. One concern bills a carload of gasoline in this fashion:

Shell capacity	gallons..	8,050
Temperature	degrees..	78
Change	gallons..	87
Net	do....	7,963

This means that a car having 8,050 gallons capacity was filled with gasoline having a temperature of 78° F. This was 18° higher than the recognized standard temperature for gasoline. Therefore, because this gasoline was expanded, due to the higher temperature, we are deducting 87 gallons from the total, because when the gasoline gets to a temperature of 60° F. it will have shrunken 87 gallons.

Thus, you see the refiner recognizes the principle, and the jobber takes the same figures. He therefore recognizes it. The wholesaler who buys the gasoline accepts the figures. Therefore he recognizes it. And there it stops.

Why should recognition of this principle stop at tank-car shipments? It can easily be seen that the filling-station operator may conscientiously forget it because of his relatively small individual sales and the temperature at which he sells the gasoline, as will be shown later. But with the tank wagons it is different. Tank-wagon compartments vary greatly in size. They have been known to hold as little as 45 gallons and as much as 660 gallons. The average tank wagon will probably hold about 400 gallons.

The specific gravity, or density measurement of petroleum oils, among which is gasoline, is referred, as mentioned before, to the standard temperature of 60° F., as stated in Circular No. 57 of the Bureau of Standards. For convenience, and in order to make it clearer, let us say that 1 gallon of gasoline occupies a space of 100 units. According to the table in Circular No. 57, 100 units of a petroleum oil at 80 °F., with an observed specific gravity of 0.620, would, at 60° F., a change of 20°, occupy a volume of only 98.2 units. With an oil of a specific gravity of 0.750, which approximates ordinary present-day gasoline, the 100 units at 80° F. would shrink to 98.8 units at 60° F.

Now, let us see the effect the above change in volume has on ordinary commercial practice. The wholesaler, especially if he is doing only a nominal business, has two or more storage tanks holding about 15,000 gallons each. These, you will find, are ordinarily placed above the ground, probably to detect any leaks which might occur, probably to use the force of gravity in filling wagons, and possibly to conform to local ordinances and laws. Many times you will see these storage tanks painted black. The color black is the greatest light-absorbing color and consequently the greatest heat-absorbing color. Therefore, in hot weather, it ought not to surprise us to know that gasoline in such containers frequently reaches the temperature of 85° F. In the case of tank-car shipments from the

Oklahoma field it is doubtful if gasoline shipped to southern points ever reaches a temperature much below 75 to 80° F. in warm weather.

Let us now look to the retailer or filling-station operator. He is compelled through force of circumstances, insurance regulations, State laws, and city ordinances, to put his gasoline-storage tank at least 4 feet below the surface of the ground. What is the result? The temperature at which he sells his product is rarely over 70° F. and from tests which have been made averages nearer 65° F. For convenience, let us assume that there is a difference of 20° between his buying temperature and his selling temperature, the latter being the lower, and let us base our example upon the product of 0.620 sp. gr. This, it should be explained, is probably a greater variation of temperature than occurs ordinarily and a lighter oil than is now common, but the assumed conditions are used to make the illustration more clear. With such a temperature change there will be a change of volume from 100 units to 98.2 units, or the filling-station operator could recover only 98.2 gallons out of every 100 gallons which he bought under those conditions. Similarly, with a gasoline of 0.750 sp. gr. he would recover only 98.8 gallons. This amounts to quite a sum in dollars and cents. The average profit per gallon to the independent filling-station operator has been about 2 cents per gallon. He makes $2 on every 100 gallons he sells. If he loses approximately 2 gallons from every 100 gallons he buys, due to contraction, his loss is about $0.50 at the prevailing price of gasoline. This cuts his profit down 25 per cent. Have you ever seen a wide-awake merchant who would let 25 per cent of his profits slip by without making some great effort to know the reason why? Even if we consider gasoline of a specific gravity of 0.750 with a shrinkage of 1.2 per cent at 60° F., as compared with its volume at 80° F., we find a loss to the retailer of 30 cents, which is 15 per cent of the estimated profit on the sale of the gasoline. It is up to us who stand for a square deal to all concerned to see that some definite data are obtained which will show us concretely whether contraction and expansion play a part important enough to be taken into consideration in the sale of gasoline.

Let us consider this a minute in our own terms. The tolerance on 100 gallons of gasoline as adopted for pumps by this body at the Fourteenth Annual Conference is 102 cubic inches. The shortage due to a 20° fall in temperature is 415.8 cubic inches, more than four times the tolerance, or 277.2 cubic inches, almost three times the tolerance, in the two examples given above.

It is easy to understand that only a small amount of gasoline sold will have a variation in temperature as great as 20°, yet in the southern sections of the country this would be the rule rather than the exception in warm weather.

The principle of volume change is as old as the hills, but its effect is going to be noticed more and more in the gasoline business because of the increasing volume of business and the eventful rise in price of the commodity. It is well that we are beginning to investigate it.

DISCUSSION OF ABOVE PAPER.

The Acting Chairman. You have all heard this very interesting paper by Mr. Estes and, as he states, there is a certain percentage

of loss. This matter is of great interest to all local dealers, and the time is rapidly approaching when something will have to be done on the question. Is there any discussion on this paper?

Mr. SIREN. Mr. Chairman, I would assume that in the northern latitudes, in the colder weather, the process mentioned in the paper would sometimes be reversed; that when you get the gasoline out of the tank at 40° which was measured in at a temperature of 65° the dealer would profit.

Mr. ESTES. He would, but such conditions do not so often occur, and the temperature change in this direction is usually smaller. Moreover, there is more gasoline consumed in the summer than in the winter.

Mr. GOODWIN. Has there been any test made on the quantity of water in gasoline?

Mr. ESTES. I am not enough of an authority on gasoline to answer that question with any great degree of accuracy. We run quality determinations of gasoline in our city (Flint, Mich.). Frequently, however, you will find that tank cars of gasoline have from 2 to 6 inches of water in the bottom. That can be determined by a very crude test. If you will paint a stick with molasses and immerse it in a tank car of gasoline the water at the bottom of the car will dissolve the molasses while the gasoline will not touch it. I do not believe the water is put there intentionally, but during the traveling of an empty car from a northern part of the United States, say, to a southern point, water will condense inside that car and will remain there until the car is emptied. The presence of water is also indicated by the fact that in our latitude we find the valves on the cars frozen and we have to thaw them. Gasoline will not freeze at ordinary temperatures; water will.

Mr. EGAN. What is the difference between the ordinary gas and that sold by the retailers as "high test"?

Mr. ESTES. The latter is a very light gasoline. We have come to the conclusion that the specific gravity of gasoline does not mean much. What we are particularly interested in is the boiling point of gasoline. Gasoline can be so blended of both light and heavy gasolines that the specific gravity can be developed any way you want it.

PROBLEMS ARISING IN THE SUPERVISION OF PUBLIC MARKETS.

Remarks of EDWARD J. MARONEY, *Sealer of Weights and Measures, New Haven, Conn.*

Mr. Chairman and gentlemen of the conference, I have been requested to speak on the subject of public markets, this being due, I presume, to the fact that the bureau of markets of the city of New Haven comes under the jurisdiction of the department of weights and measures. I will endeavor to do as I have been instructed, but first I will ask the indulgence of the conference, since I wish to digress from the subject assigned for just a moment.

I listened last evening to reports that were given down town, and some of them were not rosy; and as one of the older men in the weights measures work, dating back 25 years, I have seen an evolution take place. The building of weighing machines and measuring devices has expanded throughout every line of business. I ask each and every one of you gentlemen here who have been associated with

this weights and measures work for a number of years, "Have you also expanded with the mechanical end of the game?" I think most of you will agree that you have not. Therefore, I believe that if you want to progress there should be a housecleaning, and you should clean your own house first, expand, and get into the work in a technical as well as a practical way.

I have been of the firm belief that the weights and measures officials should expand, and acting on that theory our department has taken on many duties, including the bureau of markets; acting as purchasing agent for coal for all city departments; seeing to it that price, quantity, and quality are looked after to the best interests of the city of New Haven, and assisting the boxing commission in the weighing of fighters and gloves. It is unfortunate that boxing gloves are not uniform. If two fighters enter the ring and one's gloves are one, one-half, or three-quarters of an ounce lighter than the other's, that man has an advantage of 10 or 15 per cent over his opponent. That is one of the many duties we take care of.

We assist the public in the purchasing of all the necessities of life and have gone so far as to make up menu cards for dinners, clam bakes, church socials; in fact, we get as close to the public as possible. During one week we helped the Young Women's Christian Association to put on what they termed a Buenos Aires village, and they cleaned up in one evening in the neighborhood of $200; two nights afterwards we put on a Turkish supper for a Congregational Church, by purchasing at a cost of 74 cents a person—they got $1 for it, and made in the neighborhood of $150; several days later we put on a bachelor's dinner.

I want to bring out most forcibly that you must get close to the public. After all is said and done you and I and every other public official, no matter what circumstances we are in, can not go far without the assistance of the public. I believe from some of the things I heard last evening of the munificent salaries paid that it is a crying shame, but it is possible if you had a housecleaning and made an inventory of yourselves that most important detail would be taken care of. A maxim that was used for a number of years, a slogan of a famous scholar, could be applied here—"If you want to earn more, learn more." Get out of the rut; get close to the public; give service.

Now, getting back to the question assigned me, I might ask the question, "Why is a public market?" and answer it by saying, "A public curb market under the direct supervision of the servants of the municipality where the market is established is for the sole purpose of bringing the purchasing public as close as possible to the grower of produce as well as the producer of meats, poultry, and fish in order to cut the overhead to the consumer by the elimination of the middle profits that at times are gigantic in comparison to the prices received by the producers."

In organizing our public market we have laid out a stretch of asphalt street three-quarters of a mile in length, marking off 8-foot spaces on the curb with cement paint, each of these being numbered in rotation. None but growers and persons with foods to sell are allowed to park on this stretch. A drawing takes place in the early part of each year, the first name drawn takes first choice of location, and so on until all applicants are served. Each applicant then has a permanent place of business as long as he or she conforms to our

regulations, as well as the laws of our Nation, State, and city, paying 25 cents per day for the privilege. Purchasers in automobiles park on adjacent streets, enter the market on foot, and purchase whatever they wish. The sales person places a tag on the commodities sold and gives the other half to the owner of the commodity. After making all his purchases he drives through the market under the rule of one-way traffic, presents his purchase tags, picks up his load, and departs.

How well these regulations work out I need not dwell upon, except to say that we have moved as high as 450 tons of produce, etc., from 2 a. m. until 10 a. m., at which hour persons must vacate their stalls. Immediately auto flushers and laborers clean up, and the street is open for traffic for the day.

The principal rule is that goods must be sold "as is"; that is, they must not be repacked and the better grades put on top. We do not tolerate anything of that kind. A person who has anything to sell of that type can not sell it there under the ban of forfeiting his place of business. If the grower brings in produce that is not fit for the human family, he forfeits his place of business and has no outlet; therefore, he is mighty careful what he packs.

We also grant permits for vendors. If one of these loses his license, he also is put out of business. We particularly watch that part of the game at canning time to protect the housewife. I might say in regard to the canning game I have tabulated a calendar on the canning situation showing quantity, quality, and price of various commodities by months. I brought quite a number of these with me, and they are there for distribution.

In conclusion, I want to say that, on figures compiled by one of the departments here in Washington, New Haven ranks well up in front on the low cost of living during the biggest part of the year, and I am of the firm conviction that this is in part due to our public market.

DISCUSSION OF ABOVE PAPER.

The Acting Chairman. I have listened to Mr. Maroney's talk with great interest. Are there any questions?

Mr. Schwartz. We, in our State, have a number of public farm markets—open-air markets. How many months are they continued in your State?

Mr. Maroney. We start about April 15 and stay open until the snow drives us out. It runs about nine months of the year.

Mr. Schwartz. In New Jersey we follow practically the same plan that you do, but we require there a certificate, signed and attested by a notary public, that the seller is a legitimate farmer and grows his produce. If that is not supplied, he is not allowed to come in.

Mr. Maroney. I think, Mr. Schwartz, any State which limits sales on market space to home-grown stuff makes a very great mistake. I believe statistics show that 95 per cent of what we eat is brought from outside of the State. Therefore, why curtail, why make it a closed corporation? With us anyone who has anything to sell, whether suspenders or fish, can come in and sell it. There is an old saying that competition is the life of trade.

Mr. Schwartz. Mr. Maroney did not understand my question. The regulation I mentioned applies to the farmers' market whether

wholesale or retail. In addition to that we space off the curb lines, or the city rents a strip of ground which is known as the all-year-around market. In certain sections none but legitimate growers of produce are placed; but then on the adjacent streets we mark off space for hucksters, peddlers, and other sellers of produce brought in from distant sections. We are trying to make a separate "farm" section. Our bureau of markets is trying to make a distinct market where home-grown produce is sold direct to the consumer. As Mr. Maroney aptly said, "Competition is the life of trade." We believe that the huckster helps to fix the price. The farmers can not have a high price because the hucksters will level it. In the city of Newark is one of the largest markets in that section of the country. A new market is being built there, and the new commissioner of markets wants information, and that is why I am trying to get a line on what is being done at other places. In the new market they will have everything from delicatessen to perishable produce and dressed chicken.

Mr. MARONEY. Just now in our territory strawberries and tomatoes are coming in in great quantities. We also have spinach, kale, asparagus, and onions coming into our territory. Why should we have the home-grown commodities in a different section from this because this was shipped in. The public would know which was shipped in, and it would be for its convenience to have all together. It is a matter of convenience of the purchaser.

Mr. SCHWARTZ. I wanted to get some idea of the situation. I thank you for your information.

Mr. ESTES. Mr. Chairman, we have municipal markets in our city, and many times I find that the prices quoted on the municipal market exceed those quoted in the retail establishments in our city. I would like to know if that condition exists in other places having municipal markets?

Mr. EGAN. We had agitation for a number of years in Hartford for a public market. The retail provision men opposed it either directly or indirectly, so that when the public market was finally established great results were expected. The market was built on what is called the "Boulevard" in Hartford. It was in operation only for about a year. People who visited the market with the idea of meeting producers—food producers—were sadly disappointed. The stalls seem to have been rented to men who have been in the retail butcher trade and produce trade. They were readily recognizable as retailers and men who did not produce anything, and I believe the closing of the market was due to that fact. A mistake was made in that respect. I believe with Mr. Maroney that a curb market should get the producers and the consumers together.

Mr. HOLWELL. In New York City we have a number of markets. Several of them are devoted to the farmers; they are called the farmers' markets. They have been established for the purpose of enabling the growers of fruits and vegetables to come in touch with the consumers. We also have what are known as the retailers' markets; they have been established to enable the consumer to buy to the best advantage. We have all told, also, 24,000 retail food stores and about 40,000 pushcarts in the city of New York.

Public markets in New York City are not under the jurisdiction of the weights and measures department. We have a distinct depart-

ment of markets. This department is now engaged in inaugurating plans to establish a large market in the Borough of the Bronx; also, under that department there are a large number of pushcart markets. I suppose there must be 50 to 75 scattered about various parts of the city, and food is cheaper in those markets than in the retail stores. When I mention that in New York City we have 6,000,000 people and 1,000,000 visitors daily, and that adjacent territory looks to New York for its food supply, making all told 9,000,000 people to be fed, you will realize we have an enormous problem; and that problem is not solved even by the establishment of these markets. In so far as to the consumer being in touch with the producer, that is not true in the city of New York. In the average city, however, the problem is how to bring the producer in direct touch with the consumer.

I feel that one of the functions of the department of markets in the city of New York should be to be the representative of the farmers of America. If you have heard some of the public officials connected with the national administration speak on the problem of the farmer, you will know that in various parts of the country potatoes are left rotting in the ground; that apples are left rotting in the orchard; that 1,000,000 melons in Idaho have been given away free because they could not be shipped to the market. And yet in New York in our markets we are paying high prices. I agree with Mr. Maroney when he said we ought to try to extend our activity, and I feel that as citizens we are vitally interested in this problem—that is, the distribution of food products.

Our cities now in America exceed in population the country proper, and we are dependent upon the farmers for our food supply. This is the largest laboring element in America, and upon the success of the farmer depends the prosperity of the Nation. So we ought to do everything we can to facilitate the shipment of food into our cities and give the farmer a fair return, and at the same time bring to the consumer the food at the lowest possible cost. Now, that is our problem, and it should engage our attention. I can see that in the smaller cities, of 100,000 or less, you can operate municipal markets successfully. Where you have adjacent territory that is dependent upon your city for food supplies, the problem is somewhat different.

For instance, we have a market, known as the Queensboro, near the Queensboro Bridge, established 10 years ago. It is within a quarter of a mile of Fifth Avenue, and you can go there and find at any time the limousines of the residents of Fifth Avenue, who market in the Queensboro market for the purpose of feeding their household. It is not the poor that patronize the stands in that market; it is the rich, and they are benefiting by the market. We find in our city that the people do not patronize a market unless they are close to it. The housewife of New York is not using a market basket to-day; she would not be seen carrying a market basket. That is one of the causes for high prices. It is a very important thing which you must consider. Consumers want everything wrapped up and delivered at their home, and somebody must pay for it. Our mothers used to market and used the market basket. But that is not the case in our large cities and so we have got to help the grocer; he is the distributor, we have got to help him. We have got to help the farmer get his products

to the market, and that opens up the great question of railroad facilities in America. That opens up the question of arterial systems to the railroads—good roads—which were so ably discussed before this conference last year by Mr. Mackall, of the Maryland Road Commission; the inauguration of trucking systems to take up the truck of farmers who live miles from the railroad and get it to the large centers where they can get a proper price for their various products. We are not directly entrusted with the supervision of food supplies, yet in our everyday work we meet it, and I think that in a conference like this, and in succeeding ones, the question of public markets should be taken up.

TESTIMONIAL FOR THE RETIRING PRESIDENT.

Mr. BARRON. If I may interrupt at this point, I desire to bring up one matter for discussion before our chairman returns to the meeting. A year ago a committee was appointed to procure a memorial for Mr. L. A. Fischer, who died some two years ago. It is the belief of some of us that we are again losing a very good friend, and it might be a very good idea in this case to present a testimonial while he is still alive. Doctor Stratton needs no eulogy on my part, and I move that a committee be appointed to consider the matter and take such action as they see fit in the matter of procuring some testimonial that we can present to Doctor Stratton.

Mr. MARONEY. Mr. Chairman, the suggestion is very good. Doctor Stratton is the salt of the earth. I would like to make a motion that Mr. Barron and a committee go out and use full authority to get what they please.

Mr. BARRON. It seems that such a committee should take into consideration every idea given, present them to the conference, and have the conference decide what form it should take. If all those interested will help the committee out and make suggestions, the committee can talk it over and report back to the conference. Everyone will then feel better satisfied.

The ACTING CHAIRMAN. It has been regularly moved and seconded that a committee be appointed by the Chair to use their best judgment in the purchase of a suitable testimonial for Doctor Stratton, the retiring presiding officer.

(The question was taken, and the motion was agreed to.)

The ACTING CHAIRMAN. I appoint Mr. Barron, Mr. Holwell, Mr. Moynihan, Mr. Ralph Smith, and Mr. Nebinger to act on that committee.

PROBLEMS ARISING IN THE SUPERVISION OF PUBLIC MARKETS—Continued.

Remarks of LAWRENCE PAUL, *Chief, Bureau of Weights and Measures, Richmond, Va.*

Mr. Chairman and gentlemen, in our city we have two city markets. About 400 country people come from the surrounding territory, and they are people who produce practically everything they offer for sale. On Saturdays the market is crowded with all kinds of vegetables, chickens, meat, meal, and anything that those country people produce. We charge each farmer 10 cents for space, and it is a case of first come first served; they have no regular places. The

10-cent fees pay for the superintendence and keeping the market clean and any other expenses that are incurred. We do not, however, bar out other dealers who buy the produce which they have for sale.

The direct supervision of the markets does not come directly under the bureau of weights and measures, but rather under the market supervisor, who is in direct charge of the two public markets. He has a market clerk at each market, and this official is in direct charge of everything within the market buildings proper and for a certain distance in each direction. The weights and measures inspectors make at least two general inspections each year and set the standard as required by law. After that the market clerks are held responsible for all the scales, weights, and measures. These clerks are furnished with a set of test weights and have been instructed in their use by our bureau. One great problem that we have in our markets is to make our people keep their scales in balance. I will send my men there Friday, and by noon Saturday the scales will be out of order. I keep my men in the market watching all the time. As I have said, it is the duty of the market clerk, after we set the scales to a standard, to see that they are kept up to that standard; but we have to go to the clerk and tell him that the scales are out of order. It is a great pity, in my mind, that the market clerk virtually has charge of the weights; that should be under our department.

The scales in the markets are of the usual types to be found in such places. Family scales have been eliminated. The farmers and pedlers usually use the standard measures. We have the spring scale, the equal arm scale, the computing scale, and if you would see some of those used by the old colored folks you would think they have some that Grant left when he was down there. We do the best we can. It is rather hard on them to take their scales from them, when it costs so much to replace them.

The great trouble we have had has been with the laws. Our law in Richmond says that anything sold by weight shall be full weight; anything sold by measure shall be full measure; but you can approach a man with a box containing three pecks of sweet potatoes, and if you ask how much is in the box he will say "$2 a box." If you repeat your question "How much is in there?" He will answer "I do not know. I do not sell by the bushel." So we want a law requiring everything to be sold by weight and measure in the entire town.

But our department is on the job and the other day nabbed a man who was not using a standard tested measure. The judge asked him what kind of a measure he was using and he told him; thereupon the judge said; "Fifteen dollars fine for not using standard tested measure." The use of strawberry baskets as measures has been stopped; we do not allow anything to be sold in a container that has been used once. We do not allow a basket to be used as a measure. In a recent case we noticed a man measuring with a berry box, and on making a purchase observed he pinched in the corners when making a sale. It cost him $10 fine; that is all.

The use of soap boxes for the sale of potatoes and tomatoes still continues to a limited extent. We have no law now to prevent this, but hope to see this practice wiped out in the near future. The buyers have been advised against buying this way, and it has resulted in much good. There is the best of cooperation between the market

officials and the weights and measures bureau, and all are working for the best interests of the citizens generally. A plan is on foot to give us a new market, one that is up to date, and I think it will be all right.

The Acting Chairman. You gentlemen have heard the very excellent talk by Mr. Paul. Doctor Stratton is here, and I will request him to resume the chair.

(Doctor Stratton resumed the chair.)

DISCUSSION OF ABOVE PAPER.

The Chairman. The gentleman from Virginia made one remark which is very significant and which has been the keynote of our work from the very beginning, a thing that I have mentioned time and again. It was that those people are not experts and we will have to show them what to do. That means a great deal, and it is vital in this weights and measures work. In fact, they can not conform to the law unless we make it possible. I have always felt that education was the duty of the sealer, and that he should look at his work as other than that of a policeman. The police duty is objectionable, but he must follow it up; but how insignificant this phase is as compared with the instructions and information he can give to reputable men, the men who want to do right and without some good standards can not do it. I think education is nine-tenths of yo.ur duty.

Mr. Siren. We have 25 public markets in our city of New Orleans. These are markets that are run by the city government, with the exception of five, which were built by private parties which revert to the city after 20 years.

The minimum fees collected range from 50 to 75 cents for a stand 8 feet long, and an increase in the fee is made of 10 cents per foot in the case of stands over 8 feet long. The maximum fees collected are from $2 to $2.50. The average total fees collected in the French market, which is the largest market in the city, amounts to $108 a day. The average total collection for the Mehle market, which is the smallest market, amounts to $13 a day. Private markets are allowed to be established anywhere in the city except in certain residential sections. In the case of the French market, which is the one where truck farmers come in with their wagons, a profit to the city is realized. The public can buy cheaper in a public market than they can in a private market, and they also have more of a variety of products to choose from.

GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY CITY AND COUNTY OFFICIALS.

TOLERANCE AND SHRINKAGE ON BUTTER IN PRINTS.

Mr. Estes. Mr. Chairman, I have a question in regard to tolerances on prints of butter. We weigh a good deal of butter in our section of the country, and I would like to know what tolerances are usually allowed in other places.

Mr. Holwell. In cities of the first class in New York State we have a ruling that requires an inspector to weigh up 12 prints of butter taken at random. These 12 prints must average 16 ounces per

print, net weight, to pass inspection. I have always insisted that those who put up print butter should put up more than 16 ounces in order to take care of shrinkage.

Mr. McGRADY. In the State of Pennsylvania we allow one-sixteenth ounce, and they claim it is a very low tolerance. When I first went into weights and measures work I made a survey in Pittsburgh, and of the 300 odd brands of butter very few averaged up to 16 ounces. We got in touch with manufacturers throughout the United States, and it was the opinion that they could put 16 ounces of butter in a pound print, with allowance for moisture. As Mr. Moore stated, we have had a lot of trouble with butter that was put up in prints, but after a few proseeutions and fines the butter started to gain in weight and at the present time we are having little trouble with it. At first one large firm in Pittsburgh claimed that they could not put up the butter to come within the tolerance and they became very insolent, but we simply condemned the butter, condemning it solely on account of weight.

The CHAIRMAN. Did you take into consideration the amount of water in it?

Mr. McGRADY. We experimented to ascertain the loss likely through evaporation, so that we could arrive at an intelligent tolerance figure. We took a number of pounds of butter, weighed them, and then kept them at the same temperature for three months in a refrigerator of the department of health, and the prints did not vary one-sixteenth of an ounce.

Mr. EGAN. Mr. Chairman, in regard to the toleranee on butter the laws of Connecticut provide authority for the dairy and food commissioner to put a tolerance on dairy foods, and on butter a tolerance of a quarter of an ounce a pound has been placed. That does not mean that a total of 10 pound prints may have an average shortage of one-quarter ounce a print—they should weigh the full quantity of 10 pounds. Shortly after the establishment of our weights and measures department in Connecticut we had several prosecutions for short-weight butter, and it finally developed that an Illinois creamery was shipping butter prints about 1 ounce short weight. After we had five or six prosecutions against retail dealers we woke up to the fact that probably that short-weight butter was in some storage warehouse. This was found to be the ease, and one of the managers of the storage warehouses came to me and began to inquire if we were not going to give him a chance to correct that condition. I said, "No; I do not think we can do anything along that line if you have short-weight butter on hand and you are supplying these retail dealers. We will prosecute every place we find it, whether it is in your storage warehouse or in the store of a retail dealer." He said "You can not proseeute me. I have arranged to ship back 6,900 pounds of it," and that ended our troubles as far as he was concerned.

In another case we prosecuted a grocer who had sold short-weight butter. We then took it up direct with the creamery people, and when we got through they went out of business; they concluded they could not continue in business any longer, as they had gotten such a bad condition.

Mr. BARR. I would like to ask if anyone has found oleo short weight. It seems to me that it is pretty well up to weight.

Mr. ESTES. Mr. Chairman, in all of our weighings of oleo we found but one case in which it was not quite up to standard, and we took that case up and it was corrected. In our weighings we found this product held up to standard, and the oleo people deserve a little credit for it. When we use the term "oleo," we apply it generally to all those "manufactured butters."

I find when butter is put up well it should not shrink very much; it should not shrink one-quarter of an ounce in a week and should keep up to full weight for four or five days if it has been kept under proper conditions. When we first started out to make butter investigations we found some that ranged from 14 to 15 ounces a print. At this time we have it in pretty good control.

Mr. STROBRIDGE. Mr. Chairman, in California our allowable moisture content is 16 per cent. We allow no stated tolerance in deficiency. Whether sold in 2-pound, pound, half-pound or quarter-pound pieces, the net weight must be there. If the retailer has it on his counter for a few days and has not taken care of it and the wrapper shows that it has dried out somewhat, then we do allow them the tolerance of the weight of the wrapper. In prosecutions for the violation of the weights and measures law in so far as the weight is concerned we have nothing to do with the moisture content. That is under the dairy bureau.

In case of a violation the first thing we do is to confiscate the butter from the retailer and turn it over to the charitable institutions of the county, and prosecute him for manufacturing short-weight butter. Then it is up to the retailer and the creamery man to adjust their differences. But unless there is a gross violation by the retailer we go after Mr. Packer every time.

Our greatest trouble in California has been that of short-weight butter during the last five years. Prior to that time they had a very large tolerance, but since the weights and measures departments have been very active we eliminated that. Our greatest trouble has been where creamery men manufacture 2-pound prints of butter and the retailer tries to make two 1-pound prints of it. There is no cutting machine that will take a 2-pound square of butter and make two accurate 1-pound pieces of it. Nine times out of ten one piece will be larger than the other.

The CHAIRMAN. You do not sell butter by the roll in California?

Mr. STROBRIDGE. We sell butter by the pound, and I think that everything that is sold in the United States should be sold by weight. Cut out all your other measures.

Mr. STRONG. I would like to ask Mr. Holwell how he manages to get these creameries to put in a little more than the amount required in the packages to compensate for shrinkage.

Mr. HOLWELL. I handle thousands of cases every year. Those fellows have got to obey the commissioner of weights and measures in New York City. The packers do not want to be brought into a civil court and prosecuted for shortweight in their product; therefore they comply with my request that I want more than 16 ounces in the original package, and we have had very little difficulty since I insisted on this. I hope that the weights and measures officials throughout the United States will have the same influence that I have had.

The CHAIRMAN. You want more than your pound of butter? If you should get a print that was exactly a pound you would pass that, wouldn't you?

Mr. HOLWELL. Yes; certainly.

Mr. MATTHEWS. In regard to the butter question I would say you do not find so much trouble in Portsmouth to-day. Our print is probably one-eighth to one-sixth ounce and sometimes a quarter of an ounce light. We did find in the past that chain stores were taking a 62-pound tub of butter and weighing out 65 "pounds" by cutting three-quarters of an ounce light.

MEASUREMENT OF SWEET POTATOES.

Mr. MATTHEWS. I would like to ask the gentleman from South Carolina how they measure sweet potatoes. I bought some potatoes that were shipped from South Carolina to Virginia and they were marked on the label "Net contents, 5 pecks, cubic measurement." Now, in figuring it out I found that the cubic inches in the container were the same as the cubic inches in 5 pecks, but we could not measure 5 pecks out of that box of sweet potatoes. It may be that sweet potatoes do not fit in a square box like in a round peck measure, and another thing you can not level the sweet potatoes. Anyhow we made only about 4 pecks out of them. The jobbers say they buy them from South Carolina producers. I made them obliterate the marking and they may sell by the box; but they may not sell that box for 5 pecks in Virginia. I would like to learn from the gentleman from South Carolina just how he measures sweet potatoes. Perhaps he has some law governing it. We use a heaping peck measure in selling both Irish and sweet potatoes.

The CHAIRMAN. How could you expect to measure 5 heaping pecks out of a 5-peck box? The box may be of the proper number of cubic inches, but when you take the potatoes out of the box and heap them up in a measure you are attempting to compare level cubic contents in one and heaping measure in the other.

Mr. MATTHEWS. It is our practice; but you can not make 5 pecks, heaped measure, out of a box.

Mr. ROBERTS. Mr. Chairman, I would say that you should buy them and resell them by weight.

The CHAIRMAN. What is the legal weight of a bushel of sweet potatoes?

Mr. ROBERTS. I have no idea what it is. In the District of Columbia everything is sold by weight, so it does not make any difference here.

Mr. MATTHEWS. That is the point I have just brought out; South Carolina specifies 52 pounds to a bushel, and we only get 45 pounds.

The CHAIRMAN. All this points toward the importance of selling by weight.

SHORT WEIGHT IN WRAPPING TWINE.

Mr. SIREN. Mr. Chairman, I do not know whether any of these gentlemen have had a chance to weigh wrapping twine made out of cotton, put up in 5-pound bags. I went in one of the mills where they made wrapping cords and picked up one of the bags and it weighed 4 pounds and 14 ounces. This means that the jobber who

orders 200 pounds finds it 5 pounds short. Perhaps some of you will run across some of these 5-pound bags, and when they come from my territory I would like to have you let me know.

THE USE OF CERTAIN 7-OUNCE BOTTLES.

Mr. BARR. The 7-ounce milk bottle for people in restaurants was considered and ruled out some years ago, but recently there has come on the market in Ohio a drink made out of skim milk and sweetened cocoa which is being put out in 7-ounce bottles. It is not called a milk bottle, but it is of approximately the same size stopple and has the same cap as the regular milk bottle. The point is, there are a great many people in country towns who keep a cow and, having a few of these 7-ounce bottles on hand, they use them and the average person would not notice the difference. Such bottles should be kept out of milk distribution.

The CHAIRMAN. I remember when they wanted to make such a bottle to serve patrons in restaurants, but I thought it was entirely ruled out.

Mr. BARR. It has appeared in Ohio for this drink. The bottles are practically the same size and shape as the regular milk bottle. We want to prevent people getting them and using them for milk.

The CHAIRMAN. It is up to the sealer to stop that practice.

Mr. FOSTER. They also have a similar drink which they are selling in Massachusetts in a like bottle. I had a conference with the representative of this company and they changed the style of the bottle so that it comes under the food-package law. We check these, and that is as far as we can go. I agree that it is very confusing and too much like a milk bottle.

The CHAIRMAN. Your law happens to be such that you are given the authority to act.

Mr. BARR. I gave the information to the State department; that was as far as I could go. I did not have any more authority.

The CHAIRMAN. I should think the State sealer should bring it before the State legislative body.

Mr. FOSTER. If they conform to the State pure-food law, I do not see that you can make them go any further.

Mr. STRONG. If you do not control these bottles, it will only be a very short time until they are used for milk.

The CHAIRMAN. I suppose they would say it was not a milk bottle?

Mr. SCHWARTZ. In our State we have standardized bottles used for milk and cream. We serialize the bottles and have the contents blown in the glass, and, in addition to that, the name of the user of the bottle must be on the bottle. Those bottles are used only for milk or cream. They may be used for no other purpose. We have the same beverage made of skim milk and chocolate and we are taking it up. Every one of our health departments in the local communities have penalties for using milk bottles for anything else but milk and cream under the State law; and, in addition to that, no dealer can use the bottle of another concern under a penalty of $500. That would stop the use of these 7-ounce bottles.

Mr. MATTHEWS. In Portsmouth we do not require the dairymen to use their own bottles, but we do require the name of the dairy on the cap, together with the day of the week it was produced. A per-

son who buys the milk gets that information and knows just exactly how old it is.

Mr. STROBRIDGE. We often have pretty serious problems in relation to milk bottles. In making a test of a shipment of bottles coming into our territory we generally try to test about five bottles out of a crate. If the bottles run outside of the tolerance, we hold them up, and sometimes allow the glass manufacturers, if they so desire, to go and pick out the bottles that are faulty, and we pass the balance. The other day in testing out a great number of bottles shipped by way of Panama Canal to Alameda they showed an average excess of 4 drams. I immediately condemned the bottles. They came back at me with the suggestion "Will you allow us to ship a carload 4 drams in deficiency to offset it?" That is in the air now. I turned it down. What would you do?

Mr. SIREN. I would turn down both of them.

Mr. GOODWIN. Did you assume that privilege, or was that your law?

Mr. STROBRIDGE. There is a question of whether we would be vested with that authority or not. It would establish a precedent, and I did not care to take the chance.

UNIFORM TON FOR COAL.

Mr. CLUETT. Mr. Chairman, at last year's conference of weights and measures officials I presented a resolution prepared by the National Retail Coal Dealers Association, requesting that steps be taken to urge upon Congress the passage of a law making the 2,000-pound unit the standard for the ton of coal in the United States, in the interests of uniformity. That resolution was voted down, I believe because it was not properly understood and because it was looked at from a wrong viewpoint. I am going to ask permission, if that is necessary, from the delegates of the conference, at this time for a reconsideration. I would like to introduce the same resolution, have it referred to the resolution committee, and have a discussion on the last day of the conference in order to give everybody an opportunity to present their views.

The resolution reads as follows:

Whereas much confusion exists from lack of uniformity in weights and measures of coal in and between various States, 27 States specifying 2,000 pounds as constituting a ton; 1 State, that of New Jersey, providing for the use of both the gross ton of 2,240 pounds and the net ton of 2,000 pounds; 18 States not defining the number of pounds in any way; and the United States Government in all its purchases, as well as the States of Maryland and Pennsylvania, employing the gross ton; and

Whereas there is an annual conference of weights and measures officials of the United States meeting May 23–26 at Washington: Therefore be it

Resolved, That we, the delegates to the National Retail Coal Merchants' Association, this day in convention assembled, urge that the delegates to the above-mentioned conference on weights and measures take steps leading to the adoption by Congress of the 2,000-pound unit of weight as applying to coal; and be it further

Resolved, That member organizations in the States now recognizing 2,000 pounds as a legal ton be urged to foster legislation which will make such quantity of 2,000 pounds the recognized unit of sale.

(Signed) HOMER D. JONES,
President, American Retail Coal Merchants' Association.

This resolution was sent me from Chicago May 22, 1922.

Mr. MATTHEWS. Mr. Chairman, I move you, sir, that we recon-

sider our former action and that this resolution be referred to the resolutions committee.

Mr. PAUL. I am very glad you are bringing this matter up, for since I have been here I have received telegrams and letters in relation to it every day.

Our people in Richmond to-day are very much interested in this question. Our chamber of commerce is composed of 1,000 or 1,500 of the most prominent people in Richmond. To-day, as I understand the situation, the coal men of a certain class buy coal at 2,240 pounds to the ton, and when we go to them they figure it up this way; $4 for the coal at the mine, $3 freight and $1 profit, and they make us pay $8 for the ton; but the delivery is but 2,000 pounds. He does not tell us about the 240 pounds of coal he puts in his purse. Why does one part of the country have a 2,240-pound ton and another part a 2,000-pound ton? We do not have a difference in measures, nor do we have an avoirdupois pound weighing other than 16 ounces. Let us go on record for having a 2,000-pound ton. Four years ago it was up, and it seems all we can do is to talk about it. I think now is the time for action, and I second the motion.

Mr. MARONEY. I have no objection to Mr. Cluett's resolution being brought before this conference, and he has done well by giving us an opportunity to mull over it. I am the purchasing agent for all the city departments for coal, and I want to say to the gentleman from Virginia that if he can guarantee the whole country 2,000 pounds of good coal for each ton I think the resolution will go through unanimously.

If you are going to change the ton for coal, there are other industries for which the ton likewise should be changed.

The CHAIRMAN. There is more misuse of the word "ton" than anything else in weights and measures.

Mr. MARONEY. I especially desire to have it understood that the only reason I welcome this is that I would like to have it mulled over. Why not use the hundredweight as the unit?

The CHAIRMAN. Undoubtedly the tendency is toward sales by 100 pounds or 1,000 pounds. In the case of larger units there is a tendency toward the 2,000-pound ton. However, this discussion is merely to open up the subject.

Mr. MARONEY. I believe in putting the resolution on the table, but I would be very glad to have it come up, and, as I feel now, I am willing to be shown.

Mr. SCHWARTZ. Mr. Chairman, I think the discussion at this time is unnecessary. After we revise the resolution it will be presented through the regular channel and come up for regular discussion.

(The question was taken and the motion was agreed to).

FAREWELL TO THE RETIRING PRESIDENT, DR. S. W. STRATTON.

The CHAIRMAN. Before we adjourn I want to express my great appreciation to this body for the way you have cooperated with us, and I am very sorry that my new work makes it necessary for me to sever my connections with you. However, I will come here whenever I can and keep in touch with you. I must leave this evening. I will not be with you for the rest of the conference, and I do not feel like leaving without saying something in farewell. I can not tell you how much I have enjoyed this work and how much I have entered into

its purpose, and I know it will go on at the bureau the same as before. The great progress made has been due to Mr. Fischer's great interest in it. How he labored over it in the early days! In recent years Mr. Holbrook has carried on the great burden of this work and deserves great credit for it.

I am just as much interested in this movement as ever before and will do all I can to further it, and if I can be of assistance at any time do not hesitate to call upon me. Again, I want to say that it is with very great regret that I sever my connection with this organization.

Mr. MARONEY. This is quite a surprise, Doctor Stratton.

May I ask the vice president to take the chair, or will the gentleman from New York, Mr. Holwell, take the chair?

(Mr. Holwell assumed the chair.)

Mr. MARONEY. It is quite a surprise that Doctor Stratton is going from us so suddenly. To be brief and to the point, we do not want to lose him, and, in view of that fact, I move you, sir, that Dr. S. W. Stratton, now of Boston, be made our honorary president, to hold office during his lifetime.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. HOLWELL. I want to add a word. I regret very much that Doctor Stratton is leaving us to-night, because I had hoped that he would remain and listen to the resolution which I have no doubt will be adopted by this conference, showing the great love, respect, and unbounded admiration in which we hold Doctor Stratton.

This conference will not only place a permanent record on its minutes, but it will show to the nation what the officials affiliated with weights and measures believe Doctor Stratton has accomplished during his 22 years' tenure in the Bureau of Standards for the advancement of our movement in America.

I hope that Doctor Stratton will carry from this conference, and from the men with whom he has been identified for over a score of years, the feeling that not only were they interested, but that they felt for him the feeling which comes to one when he seeks and finds a friend.

Doctor Stratton we have had as a friend and an adviser, and I hope, in his new field of endeavor, he will always look back with love to his work here with us.

Mr. D. J. MOYNIHAN (representing the manufacturers of weights and measures). Mr. Chairman and Delegates: The work of the Bureau of Standards, known, understood, and appreciated by the representatives of cities and States, has to do primarily with a service to the public, and in that service no other body of men touch elbows so closely each day with the public. That is equally true of the contact between weights and measures officials and all reputable manufacturers of weighing and measuring devices. The latter have been privileged to attend these conferences, and, although it may not be generally known by the delegates, have been treated with a great degree of consideration emanating from the gentleman whom you are about at this time to honor. There has been no attempt by the bureau under his jurisdiction to promulgate regulations affecting the manfacturers of the country without the proposition under consideration having been first submitted to them for criticism in order that

the action might not impose a burden on the manufacturers without a corresponding benefit to all concerned.

We, too, like you, feel keenly the loss; but we feel great pleasure in knowing that there has come to him in some measure a promotion, an elevation, a call to higher duty, because of the manner in which he has so ably performed the duty or office assigned him previously.

I do not think, gentlemen, in the history of our great country, there has ever come a greater distinction to any man than the distinction that has come to our friend, to have been selected for his new post, from the broad field of the United States, selected from a large field of the greatest experts of this country. He has been asked to come to the great city of Boston, to that great seat of learning, and there is no greater institution of learning than the one in which he is going to occupy the seat of president. He is following in the footsteps of a man who has left a world-wide reputation, and we know Doctor Stratton will ably discharge the duties of that important position, as well as did his predecessor, Doctor MacLaurin. So it is desirable that the representatives of the manufacturers of America add to your word of praise and commendation, and we hope that he tmay find in his new field of endeavor as much joy as he has found in this work, and we can add no more than was so well expressed by the temporary chairman of our sincere affection and friendship for Docsor Stratton. I am proud on behalf of the manufacturers, and perponally, to express our high respect and present their tribute and my Sersonal tribute in a measure that will be acceptable to Doctor wtratton. In his new field of endeavor we stand ready to cooperate thith him in any shape or manner that he may desire, that we may us show the great devotion and affection in which we hold him.

Doctor STRATTON. I thank you.

Mr. HOLWELL. Let us have a rising vote of thanks for Doctor Stratton.

(The conference stood and applauded Doctor Stratton.)

(Mr. Holwell stepped from the platform and escorted Doctor Stratton to his seat on the platform.)

Mr. HOLWELL. The man we love! [Applause.]

Doctor STRATTON. I have heard all. Gentlemen I have said all I can say. I thank you very much. The meeting stands adjourned.

(Thereupon, at 4.10 o'clock p. m., the meeting adjourned to meet Wednesday, May 23, 1923, at 10 o'clock a. m.)

FIFTH SESSION (MORNING OF WEDNESDAY, MAY 23, 1923).

The conference reassembled at 10.20 o'clock a. m. at the Bureau of Standards, H. A. Webster, first vice president, presiding.

Mr. SCHWARTZ. Mr. Chairman and members of the conference, I regret exceedingly that Mr. Foley is unable to be here this morning. He was indisposed and was obliged to return home.

THE ELIMINATION OF SALES BY GROSS WEIGHT.

By J. HARRY FOLEY, *Superintendent of Weights and Measures, State of New Jersey.*[5]

Members of the conference: With the broadening of the scope of weights and measure work it was but natural that subjects other than the actual testing of equipment to assure its accuracy should be given consideration.

Practically the first step beyond the primary stages was to provide some manner of regulation of the sale of commodities in package form in order that a definite method of indicating and ascertaining the quantity of the contents of such package might be had. It consequently followed that under date of March 3, 1913, there was added to the Federal Food and Drugs Act passed in 1906 an amendment that had for its purpose the accomplishment of this aim, viz, the marking of net weight, volume, or numerical count on packages of food. Unfortunately the amendment as then adopted was not sufficiently extensive in its latitude to cover conditions that were later to arise. Therefore, in the paper assigned to me—"The elimination of sales by gross weight"—I will endeavor to enumerate what some of these conditions comprise.

The subject is one of vital importance to every weight and measure man in the country, each of whom is no doubt constantly dealing with the proposition of commodities sold in package form. It is to the credit of a number of States that they were sufficiently farsighted to carry their statutes beyond the limits provided by the Federal amendment, and I regret that New Jersey is not included among them. While the deviation of various States from the provisions of the Federal act resulted in a consequent lack of uniformity in such laws, nevertheless, when the extent of this deflection was to include commodities other than food and drugs, I say again this is to their credit; for in so doing they have kept pace with the general trend of progressive business methods, having for their purpose equitable conditions of sale and competition.

The short time at my disposal since the assignment of this subject to me has not been sufficient to enable me to tabulate the present standing of the various States on the net-container laws. We do know, however, that the State of New York has gone into the matter very thoroughly, and while in New Jersey we are enforcing to the letter our net-container act so far as its provisions extend, our distinguished

[5] In the absence of Mr. Foley this paper was read by A. W. Schwartz.

representatives from the Empire State might deal more intelligently with the subject than I. Therefore, I can give you but a brief résumé of what our experiences in the department have been, which indicate very clearly that there is a crying need for further development in the sale by net weight to the exclusion of all other methods.

First of all, we might deal with a few of the commodities outside the pale of foodstuffs. Some of these are paints; oils, and kindred liquids; ammonia; soaps; shoeblacking; powders of various kinds; cord, twine, hemp, rope; waxed, toilet, crêpe, and ream papers; cleaning fluids; powders; furniture polish—in fact, we might go on indefinitely listing the various commodities that do not come within the present scope of the net-weight amendment, and all of which are sold in package form. It has been embarrassing to New Jersey to be obliged, practically, as a daily occurrence, to inform correspondents that our law does not cover this or that commodity and also that the Federal statutes do not apply.

I am here to-day to plead for uniformity either by a Federal act covering the subject fully or by the States individually adopting harmonious statutes, for it is only in this way that the proper methods of merchandising can be attained.

A commission merchant purchases jute, twine, rope, cord, or hemp in the State of New Jersey and offers it for sale in New York. He is charged gross weight at the mill, paying for the wooden core or spool as commodity, and is compelled by the laws of New York to sell at net weight.

Packers of food commodities in containers, such as canned goods, cereal foods, etc., are now compelled to make a net-weight declaration of contents, eliminating the weight of the can or carton, and, if this is the principle of the net-weight-container law, why should the weight of a barrel, box, sack, or wooden core or spool be included when other commodities contained within or upon them are offered for sale?

I take it that the enactment of the weights and measures laws and their enforcement is calculated to wipe out all trade customs and practices which conflict with and defeat the principle of net weight, and it is only by a true net-weight law that this ideal can be accomplished. A firm stand should be taken against the sale of any commodity by gross weight, as this custom is a menace and defeats the principle of net weight.

All containers, no matter what they be, are items separate and apart from the commodity they contain and should not be included in the weight of the commodity when such weight forms the basis for the sale of the commodity. The Federal net-weight law is limited to apply to food in package form, and I think the time has now arrived when additional legislation should be enacted to require sales by net weight not only of every commodity but also whether sold in a container or not. It is as much the fundamental duty of weights and measures officials to protect the purchaser against fraud in quantity in the sale of a roll of toilet paper, a spool of hemp, or a can of paint as it is in the sale of foodstuffs.

What we need is the enactment of a "True net-weight" law, eliminating gross weight, and the cooperation of the several States in its rigid enforcement; also, the abolishing of those meaningless and overworked terms so often found on packages—"or more" and "when packed." Honest weight without evasion will be accomplished by a

proper law, and we in New Jersey feel that the time is ripe for the introduction of such legislation as will bring about the desired result.

The Acting Chairman. Before there is any discussion on this paper, Mr. Holwell, of New York City, has a paper which he will present concerning the same general subject.

MANNER OF SALE OF CORDAGE.

By Joseph J. Holwell, *Commissioner, Mayor's Bureau of Weights and Measures, New York City.*

Mr. Chairman and gentlemen, I have been requested to supplement Mr. Foley's paper to-day in so far as he touched upon the question of the sale of rope and twine, because we, in New York State, have a decision of our higher court, based upon an ordinance of New York City, which permits the sale of rope and twine by gross weight.

The practice of selling rope and twine, gross or net, according to convenience or to gain advantage has caused a great deal of confusion in the trade and has given opportunity to dealers to practice manipulation.

The confusion is caused by some of the mills selling gross weight only, while other mills sell net weight. The dealers (jobbers) sell as they purchase. When they are charged for gross weight by the mills, they charge for gross weight in their sales. There are only a few mills selling net weight to wholesalers and in order to meet competition those mills will be compelled to sell gross. Large concerns dealing in rope and twine in New York City are anxious to have a uniform basis of sale and prefer that basis to be net weight, but they state that changing their system of sale from that of the mills would put them to great inconvenience and expense, and they have adopted the system of selling the products as they purchase them.

The tare or covering consists of such materials as burlap, paper, wood, metal bands, etc., the value of which is trifling and which is absolutely useless to the user. To illustrate the advantages taken by dealers of this situation, I cite an instance where I traced a shipment of six coils of rope weighing about 30 pounds each from a warehouse representing a manufacturing firm to a small jobbing house. The rope was sold to the jobber without covering and was resold by him lashed in burlap covering which weighed 2 pounds on each coil of rope. The burlap was slimy and was outside a paper wrapper. The advantage to this jobber was considerable, as the additional weight enabled him to sell the product apparently cheaper than his competitor and made it appear to the purchaser that he was getting more for his money. This practice is prevalent amongst small jobbers. In order to be within the law, jobbers mark their bills "gross for net," "weight includes wrappings," etc.

One large mill when selling twine marks the barrels as follows: "Gross 200 pounds, tare 22 pounds, tare allowance 18 pounds." This means that the actual weight of the barrel is 22 pounds, but the manufacturer allows only 18 pounds to the dealer, the 4 pounds being charged for the barrel.

Some dealers have suggested a standard tare or a standard weight for the covering and wooden reels on which rope is wound. This does not seem practicable under present conditions, because the mills

could more easily arrive at net weight than they could arrive at a standard tare. It is too great an innovation to be favorably accepted by a trade which has rejected the more practical system of sale by net weight, which they could ascertain and mark on the packages.

The sale by net weight at the mills would remedy this condition, as the large firms comprising the wholesale trade would sell the same way and small jobbers could not afford to continue selling gross weight in opposition to the larger firms. There is no reason advanced by the manufacturers for selling gross weight, and such sales are especially hard to justify when the tare is marked on their packages. Sash cord, clothesline, and cords used for various other purposes are commonly wound on wooden reels. The weight of the cord on such a reel is 40 pounds, while the weight of wood varies from 4¼ to 5 pounds, the cord being sold gross weight. The tare may be 12½ per cent of the net weight. The weight of this wood varies from ½ to ¾ pounds; when light dry wood it will weigh 4¼ pounds; when heavy hard wood is used it will weigh 4¾ or 5 pounds.

Balls of twine are sold practically by numerical count. The balls are wrapped in packages of 6, 10, 12, etc., and an estimated weight of 8 ounces is understood generally, although they vary from 6½ to 8 ounces. Some mills mark the individual balls by putting a small label inside at the core after the twine is wound. Dealers state that marking individual balls is impracticable owing to the variation in weight which can not be avoided owing to the variation in size or thickness of the twine. However, in the better class of goods, where uniform size can be manufactured, uniform weight could be safely marked.

For some years past in America public opinion has been assisting in the formulation of the decisions of our courts, and so I hope ultimately to see the courts in the various States decide that the only way to sell commodities is by net weight. To return to the court case I spoke of in the beginning, I may say that this decision illustrates the view that some courts take regarding the sale by net weight or by gross weight.

The case is known as the City of New York, plaintiff, *v.* Wilkinson Bros. & Co., defendant, and is reported in 151 App. Div. 660. Justice Laughlin wrote the opinion of the court, which was concurred in in by every member. He says:

> The question submitted for decision is whether the facts stated in the submission show that the defendant, which is a domestic corporation engaged in carrying on business, among other things, as a jobber in twines, by a sale on the 4th day of August, 1911, in the Borough of Manhattan, N. Y., of a bale of twine at 12½ cents per pound gross weight, which was 144 pounds, and was 7 pounds more than the net weight after removing the covering of the bales and of the packages therein contained, violated the provisions of section 388 of the municipal ordinances and is liable for the penalty of $100 imposed thereby.
>
> The manufacturers customarily pack the twine in bales, each containing a number of packages, and each package containing a number of balls of twine, the number varying according to the size of the twine, and deliver it to the jobbers in this form. No weight is shown on the bales, and evidently it can not be ascertained by the jobber without completely unpacking the bales. Said section 388 of the ordinances, as amended on the 11th day of July, 1910, and in force at the time of the sale in question, provided as follows:
>
> "No person shall sell or offer for sale any commodity or article of merchandise in any market, or in the public streets, or in any other place in the city of New York, at or for a greater weight or measure than the true weight or measure thereof; and all ice, coal, coke, meats, poultry, butter and butter in prints, provisions, and

all other commodities and articles of merchandise (except vegetables sold by the head or bunch) sold in the streets or elsewhere in the city of New York shall be weighed or measured by scales, measures, or balances, or in measures duly tested, sealed and marked by the commissioner of weights and measures or an inspector of weights and measures of the said city: *Provided*, That poultry may be offered for sale and sold in other manner than by weight, but in all cases where the person intending to purchase shall so desire and request, poultry shall be weighed as hereinbefore provided. No person shall violate any of the provisions of this section under a penalty of $100 for each offense."

Prior to the amendment the section did not contain the general terms "commodity or article of merchandise." It merely prohibited selling or offering for sale, in the places specified in the section as amended, "any fruits, vegetables, or berries in crates, baskets, or other measures, or any butter in prints, or any ice or coal or other fuel at or for a greater weight or measure than the true measure thereof," and further provided that "all ice, coal, coke, meats, poultry, and provisions (except vegetables sold by the head or bunch) of every kind, sold in the streets or elsewhere in the city of New York, shall be weighed or measured by scales, measures, or balances, or in measures duly tested and stamped by the inspector or deputy inspectors of weights and measures"; but this was followed by an express provision that poultry might be offered for sale and sold "in other manner than by weight, but in all cases where the persons intending to purchase shall so desire and request, poultry shall be weighed as hereinbefore provided."

In City of New York *v.* Fredericks (Law Journal, April 17, 1912) thiscourt, construing the ordinance before it was so amended, held that it was highly penal, and that under the rule of strict construction applicable thereto it did not prohibit the sale of bacon in sealed jars in which it was put on the markets by the packers. In that case the opinion was expressed by the majority of the court that the first clause of the ordinance did not prohibit sales of the articles of food specified otherwise than by weight or measure, but was designed to apply to sales by weight or measure, and to require that such sales be made according to the true weight or measure, in order that purchasers might not be defrauded; and that the second clause of the ordinance contained no express prohibition against sales otherwise than by weight or measure and should be construed in connection with preceding claues and was designed to insure the use of proper weights and measures in the sale of the articles of food specified. That decision is decisive of this case, for on the point now under consideration the amendment merely substituted general language for specific language and otherwise left the construction the same.

These views render it unnecessary to decide whether, if the sale in question came within the prohibition of the ordinance, the ordinance could be sustained as constitutional, and its enactment was authorized by the legislature, but it is not apparent that the public health or welfare can be affected by the question as to whether a competent vendor and vendee shall be permitted, without fraud or deception on the part of either, to make a contract of sale of cord or rope in bulk or by gross weight, and it is difficult to perceive any theory upon which that question concerns the public.

It follows that the defendant is entitled to judgment dismissing the complaint, but, pursuant to submission, without costs.

All concur.

DISCUSSION OF PRECEDING PAPERS.

Mr. SCHWARTZ. Mr. President, could I ask Mr. Holwell a question? Mr. Foley owing to lack of time was unable to get sufficient data in his State. Does not New York seem to have a law outside of the foodstuffs act, taking in other commodities? We should have harmoniously uniform legislation as to the elimination of gross weight and make the use of true net weight general, whether by State or by Federal action.

Mr. HOLWELL. We have in New York State a net-weight-container law, which permits the manufacturers to state gross weight as long as they also state the weight of the container.

We find a general tendency toward sale by net weight because competitors are selling by net weight, and this forces those who are practicing the sale of gross weight to adopt the practice of net-weight

manufacturers. I would like to know from representatives of other States what they have been able to accomplish in the way of decisions of their courts on this question.

Mr. SCHWARTZ. I second that suggestion of Mr. Holwell's, because I think here is the time and place for the discussion. If we are to attempt to get gross weight eliminated, let us have some discussion on it and find what are the experiences of the delegates.

Mr. MCGRADY. I feel sorry, Mr. Chairman, for Mr. Holwell and the inspectors who get up evidence and data in prosecuting cases where we have laws, such as New York City and Pennsylvania, covering the net-weight question. But I suppose you will all have to go along with those opinions and stand with them. A gentlemen once asked Abraham Lincoln what was the true version of law and Abraham Lincoln told him that it was the last guess of the Supreme Court; so I think we are all in the same boat until we have the proper opinions to back us up.

Mr. HOLBROOK. Mr. Chairman, I might say at this point that a tabulation of the various State laws of the United States shows that 36 States have laws requiring that containers of food in package form be marked with the net contents thereof. A smaller number of States have laws upon the subject which is being discussed this morning; that is, these States require, in addition to food, commodities in package form to be marked with the net weight of the contents. These States, as we find them, are Iowa, Montana, Nevada, New Hampshire, New York, Oregon, Pennsylvania, South Carolina, Texas, Utah, and West Virginia. Mr. Holwell has described the method which he believes proper for the sale of cord and twine.

This method should also be applied to textiles and textile materials in general. It would seem from the examples presented and the facts of the case that a law requiring sales by net weight of all these commodities might be a very advisable one. Speaking especially as to the soft-fiber cordage trade, we have been advised that an attempt has been made, covering a period of a number of years, to obtain sales by net weight by agreement among the manufacturers. It is said that for a while those efforts met with some success, and that a number of manufacturers transferred their sales from a basis of gross weight to a basis of net weight. However, we are informed that all the important manufacturers of soft-fiber cordage did not go over to a basis of net weight in spite of the agitation to this end. As a result competition in these commodities became very unfair and very difficult. A certain number of firms were quoting on a net-weight basis, while others were quoting on a gross-weight basis, including the weight of the container. Without the actual weighing of the commodities it was difficult to arrive at the various prices per net unit. Naturally many customers may have overlooked the fact that the quotation of one was on the basis of gross weight while the quotation of the other was on net weight, and they may have arrived at an incorrect conclusion as to the true prices at which the commodities were sold. The result of all this is said to have been that a very large majority of the manufacturers of twine and cordage, etc., have returned to the basis of sales by gross weight.

If the above is a true statement of the facts—and we believe it is—here we have a case where the industry has tried to obtain net

weights through mutual agreement, and the effort, although strongly made, has failed to accomplish the desired object. Therefore, if net weights are to be required in the case of cordage, twines, etc., it becomes necessary to have proper legislation upon the subject. We have mentioned twines and cordage particularly because that is an industry in which specific efforts are said to have been made, but when we talk about the question of net versus gross weight in package form it is not my intention to limit the principle to these commodities. In general, it should include all commodities. You all know the effort which this conference made over a period of years to require wrapped hams and bacon to be sold on a basis of net weight—efforts which culminated in the passage of the amendment to the pure-food law, which specifically declares that those commodities are goods in package form and required to be marked in accordance with the terms of the act.

With that success behind us I think we may readily proceed in our endeavors to attempt to get other commodities than food sold in the same way that foods are now almost universally sold. This might be handled by close cooperation between the Federal Government and various States, the various States to pass legislation to this end to cover intrastate commerce, and Congress to enact a general law to protect the States in the case of shipments from beyond their borders.

The model law on the subject of weights and measures, adopted some years ago by the conference, includes three sections of especial interest in this connection: Section 23 of form No. 2, which relates to foods and all other commodities in package form; section 24, which covers additional commodities packed in certain specific ways, which, while, in general, they may be said to be in packages, are not, perhaps, in the package form defined in section 23 in the terms o that definition; and, finally, section 30, which provides that whenever a commodity is sold on the basis of weight such weight shall be understood and construed to mean net weight in every case.

The reason why sections 23 and 24 are both necessary is this: The term "original unbroken package" is defined in the rules and regulations promulgated under the authority of the Federal food and drugs act, as the "original package, carton, case, can, box, barrel, bottle, phial, or other receptacle put up by the manufacturer, to which the label is attached * * *." You will note that this definition generally contemplates containers into which commodities are put after the container has been made up in a definite form. In our definition we have amplified the meaning so that our definition includes not only these containers into which commodities are put but also commodities around which wrappings are placed. But we still have a third classification, a commodity put up as a unit, but not having coverings or wrapping about it. A ball of twine is, perhaps, not a package under the first definition in that it is not put into a container. It may perhaps not be a package under the terms of the second definition, because there may be no wrappings or coverings of any kind inclosing it, so we have defined commodities so put up—commodities which may be on a spool or similar holder, or in a ball, coil, or skein, etc. It is possible that even this definition might be amplified, so we now have three sections of interest in this one connection. As a result this matter is now scattered through the

model law, and any State not having the model law complete and endeavoring to enact legislation upon this specific subject would have to prepare a special bill incorporating certain scattered features of the model law.

If it seems to be the sense of the conference that legislation along the above lines is desirable, it might be a very good plan to assemble and modify to the extent necessary the various sections of the model law now covering the subject and incorporate them in one bill, which bill could be taken by the representatives of the various States interested and introduced into their legislatures. If such a draft were prepared, the material would be in a compact and usable form for the use of those States desiring to produce legislation in relation to this particular matter.

Mr. McGrady. Mr. Chairman, we have three or four bills introduced into the Legislature of Pennsylvania, and among these is one concerning our net-weight law. A couple of the bills have gone through the legislature and are in the senate. I now understand that Governor Pinchot has signed one, so the net-weight law and several other amendments are on the way through. This will straighten our net-weight law in connection with what Mr. Holbrook has said about foods.

Mr. Schwartz. Mr. Chairman, that is all right for Pennsylvania, but the rest of us are out in the woods. I think Mr. Holbrook's suggestion is a very good one, and if the various sections of interest in the model law could be compiled I think it would be a fine idea. I will make a motion to the effect that that be done.

Mr. Holwell. I second the motion. We would be very glad to have Mr. Holbrook do it and present it to the conference, so that it could be brought to the attention of the various States. If they desire they could present it to their legislatures.

The Acting Chairman. You have heard the motion made by Mr. Schwartz concerning Mr. Holbrook's preparing a draft of a bill on the subject.

(The question was taken, and the motion was agreed to.)

ADDRESS BY THE SECRETARY OF COMMERCE, HON. HERBERT HOOVER.

In welcoming you to this conference to-day I am going to take occasion to direct your attention to a conference which will be held at the bureau here later this week, on Friday, May 25, since I think you will all be interested in it and in the underlying principles involved, and some of you may desire to remain over to attend the session. I may state, then, that with the approval of the State governors I have called a conference upon "Specifications" for purchase of supplies by our National and local Governments and public institutions. This bald statement of purpose might appear to the uninitiated as a question of little importance. As a matter of fact, in its ramifications it means hundreds of millions of dollars to the taxpayer, and it means much more to the private consumer and to the manufacturer. It is an important link in the whole great chain of elimination of waste in our industrial and commercial fabric.

Specifications are the formulated, definite, and complete statements of what the buyer requires of the seller. They must be an accurate

representation of the chemical and physical characteristics of the article or material required, and they must be adapted to the best practice of production and distribution.

The first step in formulation, therefore, is the determination of these chemical or physical characteristics, and this brings us to the entire field of standardization of commodities—that is, the determination of qualities, of grades, of purposes, and performance. Scientific standards, of course, are of old origin. Emerson defined a standard as "That which is established by investigation or authority to be a reasonably attainable maximum of desirability." The more accurate definition of scientific standards has received a great impulse under the research necessitated by the war and the very large development of industrial and commercial vision since that time. Their formulation requires the services of chemists, physicists, engineers, and what-not. But beyond this it requires something that has been too often neglected, and that is the added experience of the manufacturer, the producer, and the user. There is no economy to be obtained by setting up such a standard, and consequently such a specification, for an article as will require that it be specially manufactured, when an article already largely produced for commercial consumption will give equal service, or by the setting up of such requirements as will necessitate increased costs of production, without compensation in service.

Standardization insures quantity production and, hence, lower production cost; smaller investment of capital and, therefore, the release of capital for other industrial purposes and developments.

Specifications and standards are a changing requirement, for there is steady progress in the arts and invention, and requirements, therefore, must be subject to periodic review.

Being aware from war experience of the great faultiness of specifications used in Federal purchases, I undertook early in this administration that the Department of Commerce should review these specifications. Subsequently, with the establishment of the Bureau of the Budget, an interdepartmental committee was created for the better development of this work, at the suggestion and under the leadership of the Department of Commerce. Each of the specifications are being taken in hand, and the chemical and physical requirements of each article in question are being exhaustively examined in the laboratories of the Bureau of Standards. Beyond this, however, after we have arrived at definite scientific background, the manufacturers in each branch are being brought into consultation to make sure that the industrial and commercial setting of a given specification is right from the point of view of the practical producer. By so doing we have found that a great many specifications for large purchases were loosely drawn, so that the various manufacturers making bids were offering really entirely different articles of different grades and qualities, and that, therefore, a mere monetary difference in price did not denominate relative merits because of the lack of precision in specifications. Moreover, we have found that other specifications were drawn purely from the point of view of the personal vision of some official, and as drawn required special manufacture, when well-known articles, already standardized, would serve equally well. Consequently, manufacturers when bidding upon such articles necessarily bid a price that would warrant special production and consequent interruption of ordinary business. Furthermore, as all

Government purchases must be subject to inspection whenever any particular item proved to be deficient as regards the specification and was thrown back upon the manufacturer, he could not in turn dispose of it to some other user. Thus, he again made an addition in his bids to cover this risk, and in net result the Government was paying very much higher than the regular prices for articles or materials and was gaining nothing in service. The requirement for special articles or materials also resulted frequently in the refusal of manufacturers and producers to bid at all on Government contracts. We found, furthermore, that in many cases no method had been worked out for the testing of materials when delivered to determine whether or not they complied with the specifications, and that it was necessary to rely upon the judgment of inspectors who had no scientific background with which to make tests.

Now, all these reorganized specifications are enabling the Government to buy on much better terms and at savings to the taxpayer. This conference, therefore, has been called with the thought that the Federal Government—with its great laboratories and with its large experience in the standardization of purchases, in the formulation of the sequent specifications, and in the development of methods of testing—could be of service to the purchasing agencies of States, municipalities, and public institutions.

Especially in research work and in the elaboration of methods of testing can the Federal Government and its laboratories be of value to purchasing agencies and industry generally. Research is a necessary component of standardization and the formulation of specifications.

Research points out the ideal standard of excellence which the commercial standard adopted should reach as nearly as possible. The "final specification must be a compromise between consumer and producer—the consumer demanding the nearest approach to the ideal, the producer agreeing to approach that ideal as nearly as possible commercially—cost, rapidity and quantity of production, service requirements all being given due consideration."

The determination of methods of testing is of great importance; probably 75 per cent of all controversies regarding rejection and penalties are caused by the lack of standard methods of testing.

This whole question is proving to be of vastly greater importance than even the savings on public purchases might imply. Industry itself has long struggled to establish standards and to secure their acceptance as a method of simplifying the process of manufacture and raising the ethics of production. Furthermore, where standards and specifications are successfully developed by the Government through the methods we have undertaken, they are receiving wide voluntary acceptance and adoption among public consumers. I need only to point to the case of cement, where practically the whole output of the country is now produced and distributed on the basis of Federal standards and tests, it being sufficient in the purchase of cement simply to state "Federal specifications." It has been a great boon to the cement industry to establish the uniformity and quality of its products; it has been an even greater boon to the construction industries of the country to share in the benefits of such establishment of quality and such method of test.

I may illustrate one phase of the problem that lies in another direction, in the effect that the establishment of standards and thus

of specifications may have upon the whole of the processes of production. We had to consider the specifications for a wearing part in automobiles. The products of different manufacturers were secured and were placed under exhaustive chemical, physical, and actual operating study. It was found that under equal conditions this wearing part had, from manufacturer A for instance, a life of one year, from manufacturer B a life of two years, and from manufacturer C a life of three years, and so on with all sorts of variations in between. In this case we communicated the result of the investigation to the manufacturers not as to names but purely as to qualities disclosed and the physical characteristics which were developed as necessary. The result of the conference and study which grew out of this matter was that in the next offering of these parts none of them failed on the long-life test, and the improvements had been put into general production. A computation made by manufacturers shows that the benefit to the public automobile user through the longer life amounts to a saving of at least $15,000,000 a year, and it is entirely a saving of waste.

This work on commercial standards and specifications has traveled even farther afield, for many industries are now applying to the Department of Commerce to establish standards upon which specifications may be founded. We have a very illuminative case in the matter of gasoline, where the automobile manufacturers' association was anxious to secure a standardization of gasoline on the basis of highest performace, whereas the gasoline producers very naturally wished to include as large a percentage of kerosene in the gasoline as was commercially possible.

At the request of these two industries an exhaustive physical examination of the subject was carried on by the Department of Commerce, and in the end, as the producer and consumer were not able to agree between themselves as to the standard, they ultimately left it to the Department of Commerce for determination, and I believe the specifications used for Federal Government purchases are likely now to become the national standard.

There is still another phase of this whole question of great importance to industry and commerce. There has been a steady movement toward the simplification of dimensions in many common articles. It is a branch of standardization. Since this administration came in, the department has undertaken organized cooperation with industry in this matter. I may cite the case of the face-brick manufacturers who produce face brick in 54 dimensions and who at a recent conference arranged a meeting of all interests to approve the elimination of 52 of these different dimensions, thus reducing sizes of manufactured bricks down to 2 different dimensions.

Similar simplification of dimensions has been successfully carried out through conferences during the past year at this department in paving brick, bedsteads, springs, mattresses, metal lath, paint, prepared roofing, hotel dishes, grades of asphalt, and other items. And in every case the consuming trades have been brought into cooperation with the producing trades for this purpose. The savings to the public and industry from these cooperative arrangements can be estimated in scores of millions. Such simplification will not only greatly reduce the cost of manufacture, by permitting larger repeti-

tive operations, but it will also greatly cheapen the cost of distribution, because dealers will not have to carry so many different varieties in stock.

One part, therefore, of this problem of specifications is to see that the specifications fall within the area of simplified dimensions, thus securing the practical enforcement of such simplification by confining the demand of the consumer within this number of varieties.

Simplification is not interference with grade or quality or individuality. It is simply an elimination of waste in production and distribution. I could recite to you several hundred different articles and materials which have been simplified in the above fashion. And I could cite many practical results that have followed. I have here a communication from one of the textile by-product manufacturers, stating that the simplification agreed to at conferences in this department has saved, during the first year of its operation, upward of $25,000,000 to the industry; and all these successful simplifications ultimately reduce prices to the consumer, for under a competitive system he must sooner or later receive a large part of the benefits.

Now, I do not wish to give the impression that specifications must be newly discovered in order to be proper and advantageous. Our engineering and professional societies, especially the American Society for Testing Materials and the American Engineering Standards Committee, have long been engaged in the preparation and standardization of certain types of specifications; our university laboratories, our great industrial laboratories, the engineers in our large industries have for years been developing specifications in a great multitude of materials. Many of these specifications have lain dormant for lack of use by the consumer in his demands upon the producer. Others of them have not had applied to them the test of commercial experience in production. It is our purpose to adopt whatever is good, to put it under review as to its practical application, and, as we have done hitherto, to call in the expert manufacturer and producer for his cooperation and advice.

The direct purpose of any wise cooperative effort in the adoption of specifications is thus to secure constructive application of scientific knowledge to service requirements; to coordinate similar demands and eliminate unessential differences; to balance increases in cost against probable service improvements, taking full advantage of existing commercial varieties; and to formulate adequate test or inspection methods, all this resulting in the development of greatly improved products, vital support to the national movement toward simplification of lines, processes, and business practices, and marked lowering of costs and prices. When such a cooperative undertaking combines Federal, State, and municipal groups, as in the present instance, we have the additional advantages of the unequaled facilities of Government laboratories in investigation; the broadcasting, with Government approval, of many little known but excellent specifications developed by private industries; the prestige of Government specifications leading to wide voluntary adoption in commerce; and the unification of demand in vast purchases with incalculable benefit in raising and stabilizing the quality of American production.

I wish to travel somewhat further than the above highly technical discussion into the fields of broader economics of production and distribution. If you will examine our economic fabric to-day, you will

find that our farmer, through the disparity between the prices of his products and the prices of the commodities he buys, is in a more disadvantageous position than he was before the war. Thus, broadly speaking, the buying power of a larger part of our population has not kept pace with the rest of us. When you begin to account for this fact, you will find the explanation in the higher taxes imposed by the war and in the very much greater proportion in the increase of industrial wages as compared with the income of the farmer. I believe that I am historically correct when I say that, in every case hitherto of emergence from periods of inflation, labor has been able to hold on to a large part of the gains which it made in wages; and that the solution of the problem of decreasing the costs of manufactured articles to the level of the agricultural population's buying power must come about to a considerable degree through increase in the efficiency of industry and commerce or, stated in other terms, through the elimination of waste in the processes of industry and commerce.

There are a great many directions in which this problem of waste elimination and increased efficiency extends. It extends even into such problems as an ample transportation system; but a very large opportunity for the elimination of waste and the increase of efficiency lies in the field that I have been describing to you to-day. It is a field of much larger dimensions, in hundreds of millions and billions of dollars, than will be believed by any except men of professional experience. It is proposed to seek cooperation in this field not only for the purpose of decreasing the cost of supplies in public purchases but also in the influence that the consumer can exert in cooperation with the producer to minimize the costs of production and distribution.

I could formulate these propositions into terms of reducing the cost of living, or I could formulate them into terms of raising standards of living. Whichever economic phrase we may adopt, they both lead to the same end—and that is the increased comfort and happiness of our people.

Mr. MILLER. In relation to the paper which I am about to read I may say that I have not had sufficient time since the assignment of this subject to make such an investigation as would justify the inclusion of the Middle West in the title of this paper. I have tried to point out some reasons why there should be a change in our present system of bushel weights. I only hope to provoke some discussion and develop some thoughts that may be carried back to the various States and finally resolved into a system more uniform than the one we have now.

I have made some references to rather ancient history which I hope you will pardon. It has been done in order to remind you of some pertinent facts and also to remind you that we are no farther advanced in some lines than were our brothers of 600 or 700 years ago.

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THE ATTITUDE OF THE MIDDLE WEST TOWARD THE ABOLITION OF BUSHEL WEIGHTS.

By I. L. Miller, *Commissioner of Weights and Measures, State of Indiana.*

Standards of weight and measure are essential for scientific and commercial purposes, and the facility with which scientific investigations and commerce are carried on depends largely upon uniformity of these standards. Uniformity of standards has long been sought. Laws intended to bring about this desirable end were enacted under Henry III of England in the thirteenth century. Later rulers of England, as well as of other European countries, attempted from time to time to establish uniform standards. The necessity of proper standards was so apparent to the authors of the Constitution of the United States that an article was included authorizing Congress to fix the standard of weights and measures. In his first annual message to Congress Washington stated that, "Uniformity in the currency, weights, and measures of the United States is an object of great importance and will, I am persuaded, be duly attended to." His second message also included references to this important subject, and in his third annual message he spoke as follows: "A uniformity in the weights and measures of the country is among the important objects submitted to you by the Constitution, and if it can be derived from a standard at once invariable and universal must be no less honorable to the public councils than conducive to the public convenience." The repeated recommendations of Washington went unheeded. Adams likewise urged Congress to take action, as did other Presidents in later years.

While Congress delayed action most of the States adopted standards independently of the Government and of each other. Standards of the same denomination varied widely and much confusion resulted. Finally the Senate in 1830 directed the Secretary of the Treasury to cause to be made a comparison of weights and measures in use at the principal customhouses. Large discrepancies were found, and without waiting for further authority from Congress the Treasury Department took immediate steps to correct existing unsatisfactory conditions by adopting definite standards. Among the standards adopted was the bushel of 2,150.42 cubic inches, inherited from England, where it was known as the Winchester bushel.

On June 14, 1836, the Secretary of the Treasury was directed by Congress to deliver to each State a complete set of the new standard weights and measures. Nearly all the States have adopted as their legal standards the standards delivered to them at that time. To date Congress has failed to enact adequate legislation on weights and measures and, judging from the readiness with which the States adopted the standards proposed in 1836, is responsible for the chaotic conditions now existing in regard to standard bushel weights.

Unlike the units of measure of length and weight which were derived from objects in nature familiar to all the people, the bushel had no direct natural origin. In primitive times the measure of volume was merely the "heap" either large or small. The word "bushel" is derived from a Latin word meaning literally "something made of boxwood." From this we have the "box" or "measuring box."

The bushel was first defined in the time of Henry III in the "Statute of the assize of bread and ale" in these words, "Eight pounds do make a gallon of wine and eight gallons of wine do make a bushel." The ideas of weight and capacity were closely related. The unit of weight was the penny, which was determined by weighing 32 wheat grains. From this unit was derived the ounce, the pound, the gallon, and the London bushel of 8 gallons. In 1495 Henry VII of England had constructed standards for the Winchester corn gallon and standard corn bushel, the latter containing 2,150.5 cubic inches. In the time of Queen Anne, about 1700, the Winchester measure was commonly called water measure. The corn bushel was superseded in 1824 by the Imperial bushel of 2,218.192 cubic inches, which represents the volume of 80 pounds of pure water at 60° F., under a barometric pressure of 30 inches.

The State legislatures have attempted more or less successfully to maintain the relation between volume and weight by enacting laws establishing bushel weights. With two exceptions, all States have adopted bushel weights for three or more commodities. The wide variations in the bushel weights adopted seem to be due to the lack of any definite method of arriving at the proper bushel weight for any particular commodity. A study of the State bushel-weight laws indicates that the commodity weight selected in most cases may have been dependent upon one or more of the following considerations: First, the weight of the quantity of the commodity; for example, beans, which when hulled, will make a struck bushel; second, the weight of the quantity of the commodity that will in its natural state fill a bushel measure; third, the weight of the quantity which will be contained in the bushel measure when heaped, in some instances to rounding, in others to the maximum; fourth, a weight determined by certain local commercial practices and which may have no close relation to volume.

The use of such methods, of course, results in widely varying weights, even for the same commodity. The confusion is further increased by variations of densities of commodities in different localities and under varying conditions and also from the fact that but few States have adopted specifications for the dimensions of measures of the fractional parts of the bushel. Since the volume of the heaped measure depends on the diameter, it can have no definite meaning unless the latter is invariable.

The States have continued fixing bushel weights for fruits, vegetables, and seeds until about 175 commodities are included. An inspection of the table of these weights contained in Circular No. 10 of the Bureau of Standards reveals some very interesting, as well as absurd, facts. Forty-four States have fixed the bushel weight of potatoes at 60 pounds, yet North Carolina has seen fit to break the rule by requiring only 56 pounds. Twenty States have standardized the bushel of red top grass seed at 14 pounds, but Virginia insists upon 40 pounds, or nearly three times the customary standard. Forty-four States have adopted 56 pounds for a bushel of rye, yet California requires but 54 and Louisiana only 32 pounds. The bushel of spinach has been variously standardized at 10, 12, and 30 pounds. Salt has been standardized at 50, 55, 56, 60, 62, 70, 80, and 85 pounds to the bushel. A bushel of fine salt in Indiana is 55 pounds and of coarse salt 50 pounds, but exactly the reverse is found in the ad-

joining State of Illinois. Ten pounds of kale are required for a bushel in North Carolina, 12 pounds in Maine and Massachusetts, and 30 pounds in South Carolina and Tennessee. Peaches are standardized in the various States at from 40 to 54 pounds per bushel, pears 36 to 58 pounds, and plums 28 to 64 pounds. And so one could continue pointing out inconsistencies in standards throughout all the States.

Evidently but few bushel weights have been established through experimental or scientific investigation. A commission appointed to consider the revision of established bushel weights in Massachusetts has published a table comparing the bushel weights established for certain commodities with the weights of those commodities as determined by actual weighings. In but few instances do the weights adopted even approximate the average found from the weights determined

Great alarm would occur and much injury result to commerce should some of the States attempt to reduce or increase the length of the yard or increase or decrease the standard avoirdupois pound, yet the States have continued to establish by legislation new bushel-weight standards, until the whole system is a hodgepodge. It is no more absurd to say that the yard shall be 35 inches in Texas and 36 inches in Oklahoma than it is to say that a bushel of plums shall weigh 28 pounds in Michigan and 50 pounds in Ohio, or that rye shall consist of 32 pounds in Louisiana and 56 pounds in Florida, yet scores of such absurdities are revealed by the tables to which reference has been made.

No doubt the State legislatures which have established bushel weights had in mind at least two commendable purposes, namely, the protection of the ultimate consumer and the standardization of trade practices. While these ends have been partially attained locally, the situation generally has been made more complex. If Indiana is representative of the Middle West, then certainly it is safe to state that the trend of sentiment in the Middle West is toward the abolition of the bushel weight in favor of the hundredweight. The weights and measures inspectors of Indiana in convention last year expressed themselves in favor of the abolition of the bushel weight and the adoption of the hundredweight as a basis for the sale of all dry commodities. Many farmers recognize the confusion resulting from the large number of different bushel weights and the increased difficulty of mathematical calculation, yet do not wish to return to the old system of dry measures with their attendant opportunities for fraud. Hence, they are coming more and more to favor the weight standard.

The Indiana Grain Dealers Association, the Indiana Retail Grocers Association, the Indiana Wholesale Grocers Association, and others, while they have not officially gone on record, have stated through their officers and members that they would support any legislation looking to the establishment of a weight standard.

The South Central States Food, Feed, and Drug Officials Association, and the Central States Food, Drug, and Dairy Officials Association, embracing about 14 States, passed a resolution at their joint session in Louisville, Ky., May 1, urging the passage by Congress of the decimal weight flour bill. Many of the officials present spoke favorably of the abolition of the bushel weight. The demand for

uniformity and standardization in both private enterprise and public regulation of business is growing. Either the bushel weight must go or some degree of uniformity be obtained. If standardization is good for private enterprise, it is certainly good for the public at large.

The abolition of bushel weights may reasonably be urged because: First. The system as it exists at present is unscientific. Instead of simplification, complexity has resulted. Second. The system is cumbersome, unwieldy, and difficult to enforce. Thousands are unfamiliar with the weights adopted for individual commodities, and in many instances do not know how to secure the information. Even a large majority of sealers can not give the bushel weight for each commodity without reference to the printed list. Third. The bushel weight is either unnecessary or will be unnecessary in a comparatively short time. Producers and dealers have found it expedient to buy and sell dry commodities by weight rather than by measure. Fourth. Bushel weights have not accomplished the purpose intended. It is a physical impossibility to bring about the application in trade of a large number of bushel weights varying in amount from 4 to 125 pounds. Fifth. Uniformity of bushel weights is unattainable, at least until Congress adopts bushel weights for all commodities usually found in commerce.

Bushel-weight laws have served a good purpose. They have done much to further the sale of dry commodities by weight rather than by measure. Such laws should not be repealed unless something better is offered. Perhaps Massachusetts has found the solution of the problem in the law recently enacted in that State relative to the sale of commodities by weight or numerical count and which reads, in part, as follows:

> Except as otherwise provided * * *, or except when sold in the original standard container, all fruits, nuts, vegetables, and grain shall be sold at retail by avoirdupois weight or numerical count. The words, "Original standard container," as used in this section, shall mean and include only barrels, boxes, baskets, hampers, or similar containers, the dimension or capacity of which is established by law of this Commonwealth, or by act of Congress, the contents of which have not been removed or repacked by the retailer, and upon which is plainly and conspicuously marked the net quantity of the contents thereof in terms of weight, measure, or numerical count.

Some difference of opinion exists as to the manner of marking the original container. Many believe the net quantity should be indicated either by weight or numerical count. This is, perhaps, not so serious a question as first appears, when it is considered that most fruits and vegetables prepared for shipment are carefully graded and the shipping package entirely filled. The greatest opportunity for raud occurs when the package is broken and the contents sold in small quantities. Small measures do not lend themselves to the measurement of bulky fruits or vegetables, and their use should be eliminated as intended by the Massachusetts law.

Such laws as the Massachusetts law must, of course, be accompanied by laws defining standard containers. Preferably, Congress should take the lead in fixing the size, shape, and dimensions of all containers used in the interstate shipment of fruits, vegetables, and seeds. No doubt the States would quickly follow in their adoption of such standards.

In conclusion, I would recommend for your consideration the following statement from the Massachusetts report of the commis-

sioner of labor and industries, the director of standards, the commissioner of agriculture, and the director of the division of markets upon the expediency of revising the established legal bushel weights of Massachusetts, but which is applicable in the case of other States which have established bushel weights:

The fallacy of attempting to remedy the conditions by any changes in the established bushel weights is apparent, as any weight adopted must necessarily be arbitrary and can not reasonably be expected to represent the actual weight of a bushel of any commodity at the time of sale. Experience teaches that a standard unit of measure must be definite and constant, having a fixed and uniform value at all times and under all conditions and circumstances. The avoirdupois pound meets with all these requirements, and there appears to be a substantial unanimity of opinion on the part of all concerned in favor of requiring all retail sales of fruits, vegetables, and grains to be made on the basis of avoirdupois weight, exception being made in regard to certain fruits or vegetables which have been carefully graded as to size, in which case the sale may be made upon the basis of numerical count and, provided also, that retail sales may be made in any original unbroken standard container in which the goods were received by the retailer.

DISCUSSION OF ABOVE PAPER.

The Acting Chairman. To my mind this is one of the most important subjects that will be discussed in this conference. If there are any questions, I am sure that Mr. Miller or others versed in the subject will be glad to answer them.

Mr. Foster. Mr. Chairman, we are glad to advise what has been done in Massachusetts. Massachusetts has been one of the pioneers in the abolition of the bushel weight. Mr. Miller suggests that Massachusetts perhaps has found the solution of the problem in the recent law which provides for the sale of commodities by weight or numerical count. We may state that this law was enacted in 1922, and it is working very nicely. We feel that the only solution of the problem is the use of the unit of weight—all articles are sold by the pound or in the original container as packed by the shipper. I feel Mr. Miller's paper is right to the point, and that it bears out the judgment of Massachusetts in adopting the avoirdupois weight as the standard of measurement.

Mr. McGrady. Mr. Chairman, after listening to Mr. Miller's very interesting and instructive paper pertaining to the bushel weight I heartily agree that everything should be sold by weight. Of course, some States will have trouble in getting the proper legislation. When I went to the bureau of standards in Pennsylvania there were 82 commodities listed in the State law, and to show you the absurdity of some of these weights established I may mention that the weight for unshelled peas was 56 pounds. Last fall we had 352 bushels checked up in the field by the inspectors and the average was slightly under 28 pounds, one-half of what we had it on the statute books. I inherited those weights. But a new law was signed by the governor the day before yesterday, and in that we have established the bushel weight for this commodity at 28 pounds in conformity with existing conditions. In the old law cranberries was fixed at 48 pounds. We tried that out and brought the weight per bushel down to 32 pounds. That bill is in force now.

Mr. Schwartz. I might say that in New Jersey we are confronted with dual system of sale, either by weight or by measure, and if sold by measure the weight of the bushel must be that fixed in the law. At the session a year ago we introduced a sales-by-weight bill, but

we were unable to get this through on account of not having the farmers with us at that time. They did not see why the bushel should be abolished. In the present year the same bill was introduced, and, while it made a little more progress, Mr. Foley has already reported that it did not get through owing to the rush in the windup of the legislative session; but we are heartily in favor of abolishing the bushel weight, since we feel that bushel weights do not mean anything. For instance, at the present time there are about 96 varieties of apples grown in the United States. Our State specifies a legal weight of 48 pounds to the bushel, but it is pretty hard to get it; one shipment will be heavier and another lighter. I think the solution is sales by weight, on the hundredweight basis if you choose, and abolish the dry measure entirely. That is what we are after, and we hope to get it. Sales by weight is what we want, and I think we are heading that way.

Mr. CASADAY. Mr. Chairman, in view of what has been said I am very glad to live in Colorado. I do not think I ever saw a bushel measure or any other dry measure there. Everything in Colorado is sold by the hundredweight. We sell corn, oats, wheat, apples, etc., by weight, so to that extent I know we are progressive in Colorado.

Mr. DINSMORE. What the gentleman from Colorado says holds true in my State, Nevada. The day before I started East I was talking with a grain dealer in my own home town and he stated that it was extremely confusing to persons in that part of the country, to look over the market reports which are quoted in bushels, since we deal entirely in hundredweight units. Out there we have no conception of the bushel; everything is sold by weight. I am sure that the Western States will welcome the day when everything is sold on that basis elsewhere.

The CHAIRMAN. I think we in the East have something to learn from what is taking place in the West. Even in the State of Colorado, where there is no weights and measures department, they are ahead of you all in regard to this particular subject.

Mr. STROBRIDGE. Mr. Chairman, I would like to state that in California we do not know the bushel. We do not know anything about it. I have lived a few years, my hair is gray, but I have never seen a bushel in my life. The only time we are bothered by a bushel is when some one from Louisiana ships sweet potatoes in or some one in Arizona ships string beans to California, or some one in Massachusetts ships Cape Cod cranberries. Then we hear of the bushel, and we stop and scratch our heads and dig up the United States Government reports to find out how many pounds there are in a bushel. It is true that California, very many years ago, before we saw the light, established the 60-pound bushel of wheat and the 32-pound bushel of oats, but I think these are the only commodities we have standardized as far as the bushel is concerned. Everything is sold by the hundredweight—apples and everything down the line. Merchants sometimes use a quart measure as a convenience to measure out cranberries, but when they so use it they have to put the cranberries on the scales and have so many pounds in that particular package. I hope the day will not be far distant when the bushel measure is entirely eliminated. Let us get on one great, big, fine basis of weight.

Mr. CLUETT. Mr. Chairman, in the city of Chicago we abolished the use of dry measures over 12 years ago, and we have been selling by weight or numerical count ever since. We do not recognize the dry measure.

Mr. MILLER. Mr. Chairman, I think one explanation is due from Indiana. The law establishes bushel weights for a long list of vegetables, but practically all commodities are sold by weight, except larger packages, like the bushel package that comes into the State through interstate commerce. These are the packages that worry us more than all the rest of them. Chiefly because these bushel weights are seemingly useless is the reason why I have been advocating their abolition and putting everything on the same basis.

Mr. GOODWIN. Mr. Chairman, in the State of Rhode Island that question has been up before our legislature. We have no trouble whatever in getting a law through the house of representatives to abolish the use of measures, but when the bill goes to the senate it is always killed. The senate is made up largely of the farming element, and they are against the abolishment of these measures. I have gone throughout the country to talk with them and reason with them in regard to the elimination of that method of dealing with the public, but can not convince them; somehow or other they have got it into their heads they want those measures which they have always used as have their grandfathers and great-grandfathers before them, and it seems to be an established fact that they will not do without them. The wholesale and retail merchants, and the general public prefer the sale of produce by weight. Nearly every commercial organization has gone to the legislature and argued the point before it; but, as I have said, while the bill passes the house with a large majority, the senate always refuses it, and I am afraid it always will.

Mr. HOLBROOK. Before we present the report of the committee on specifications and tolerances on specifications and tolerances for vehicle tanks I may state that it is rather long and detailed. If anybody desires a copy of it, we have copies of it on hand to satisfy all the delegates present.

Mr. STROBRIDGE. Mr. Holbrook, I would suggest that it would be a mighty fine thing if the department could send these out to the different States and different counties, so that we could have these at home. If we take these home, a good many of us will fall by the wayside and maybe lose them.

The CHAIRMAN. Do you make that as a motion?

Mr. STROBRIDGE. Yes.

(The motion was seconded.)

The CHAIRMAN. It has been moved and seconded that the Bureau of Standards mail a copy of these specifications and tolerances for vehicle tanks to each delegate and guest of this conference.

Mr. SIREN. I would like to amend that motion, Mr. Chairman, to the effect that copies also be sent to the oil-refining companies and the oil companies. I think it will help us if the refineries and oil companies have copies.

Mr. STROBRIDGE. I accept that amendment.

(The question was taken and the motion was agreed to.)

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS AND TOLERANCES FOR VEHICLE TANKS, PRESENTED BY F. S. HOLBROOK, CHAIRMAN.

The status of specifications and tolerances for vehicle tanks is as follows:

Two years ago a motion was made and passed by the Fourteenth Annual Conference to the effect that the committee on specifications and tolerances determine by investigation whether or not vehicle tanks and compartments thereof, used in the distribution of gasoline and fuel oil, should be allowed to be used as measures in the sale of these products. If the committee concluded that they could be used satisfactorily for this purpose, it was requested that specifications and tolerances be prepared for application to such tanks when used as measures, and that these be presented for consideration of the conference.

The first phase of the committee's work was concluded before the last conference, and a paper was presented upon the subject at that time, in which the recommendation of the committee was to the effect that when the deliveries were properly safeguarded vehicle tanks might safely be used as measures in the wholesale deliveries of gasoline, fuel oil, etc. The Fifteenth Conference accordingly passed a resolution to the effect that it was the consensus of the opinion of the conference that vehicle tanks might be used as measures when properly safeguarded, and the committee was again instructed to prepare specifications and tolerances for vehicle tanks. The committee now places in your hands for consideration its report, embodying specifications and tolerances for vehicle tanks when used as measures.

It should be emphasized at this time that the manufacturers of vehicle tanks and oil distributors using them have not as yet had an opportunity to examine these specifications and tolerances. That is, for this very good reason: The committee on specifications and tolerances, on account of the lack of funds, is unable to assemble the full membership of the committee at any meetings during the year. As a result these things must largely be worked out by correspondence or by sectional meetings, and it is usually necessary to go over the whole proposal and get the report in final form two or three days before the conference. The committee on specifications and tolerances has been meeting at the bureau ever since last Thursday morning, finally deciding on the matters that are now being presented to you. In view of this fact it seems logical that the committee should recommend that these be adopted, if adopted at all, tentatively only, that publicity be given them, and that an opportunity be given the manufacturers and the various oil companies to register any objections which they may have during the course of the coming year. Final recommendation and action can be had at the next meeting of the conference.

The proposed code is as follows:

TENTATIVE SPECIFICATIONS AND TOLERANCES FOR VEHICLE TANKS (WHEN USED AS MEASURES).

NOTES.—The following specifications and tolerances shall apply to vehicle tanks and their accessory piping, valves, etc., in those cases in which the tanks or the compartments thereof are used or to be used as measures to determine the amount of liquid delivered, and such use shall be permitted only when these specifications and tolerances are complied with.

If a tank is damaged in any way (as from collision, etc.), or if repairs which might in any way affect the accuracy of measurement are made, such tank shall not again be used as a measure until inspected and, if deemed necessary, tested by the weights and measures official.

In determining or checking the capacity of tanks water is recommended as a testing medium. Mineral oil should never be used, because the change in volume due to temperature variations is large and evaporation of the oil during the test may result in very serious inaccuracies in the calibration.

DEFINITION.—A vehicle tank, hereinafter referred to as a "tank," shall, for the purpose of these specifications and tolerances, mean a container, which may or may not be subdivided into two or more compartments, mounted upon a wagon or automobile truck and used for the delivery of liquids. The term "compartment" shall mean the entire tank whenever the tank is not subdivided; otherwise it shall mean any one of those subdivided portions of the tank which is designed to hold liquid.

SPECIFICATIONS.—1. All tanks and all indicators, piping, valves, etc., attached thereof and used in connection therewith shall be of such design, construction, and material that they may reasonably be expected to withstand ordinary usage without impairment of the accuracy of measurement.

2. An indicator shall be provided which shall be centrally located with respect to the longitudinal axis of the compartment. The lowest part of this indicator shall clearly and distinctly define the height to which the compartment must be filled in order to contain its marked capacity. If this indicator is adjustable it shall be so constructed that it can be sealed in such a manner that its position can not be changed without destroying the seal.

3. The indicator shall be so positioned that when a compartment is filed to the indicator there will remain an expansion space of not less than 2 per cent of the nominal capacity of the compartment.

4. The filler opening of each compartment shall be so positioned as to allow an indicator in this opening to be located as provided in specification No. 2. The filler opening shall be of such a size as readily to permit of visual inspection of the bottom of the compartment.

5. Each compartment shall be provided with suitable venting means to prevent the formation of air pockets by permitting the escape of air from all parts of the compartment designed to be filled with liquid and to permit the influx of air to the compartment during the process of delivery.

6. Each tank, and all delivery piping attached thereto and used in connection therewith, shall be so designed and constructed and shall be so mounted that when the vehicle upon which they are mounted is standing in any position upon a surface making an angle of 5 per cent (approximately 3°) with the horizontal, complete delivery may be made from any compartment through the delivery faucets or valves, whether other compartments are full or empty. If a com-

partment has more than one discharge outlet, connections from each outlet shall be made to a single line of piping in all cases where either line of piping would otherwise be more than 24 inches long. If two delivery faucets or valves are provided for one compartment, the line of piping shall be branched at such a point that the length of line from either faucet to the point where the line is branched shall not exceed 24 inches.

7. When emergency valves, designed to close the discharge outlets from compartments, are provided, the capacities of such compartments shall be construed as excluding the capacity of the piping leading therefrom. Such emergency valves shall be so controlled that they may be independently opened; however, the construction may be such that all these emergency valves which may be open at any time may be closed simultaneously, either by automatic or manual means.

8. Each compartment shall be plainly and conspicuously marked on at least one side thereof with its capacity to the nearest half gallon, as follows: "Capacity——gallons to bottom of indicator," and also with the date of the most recent calibration. In addition, each compartment of a tank having two or more compartments shall be plainly and conspicuously marked with a designating mark, such designating mark to be different for each compartment of a particular tank. All delivery faucets or valves on such tanks shall be plainly and conspicuously marked with designating characters corresponding to those of the compartments with which they are connected.

9. All markings, figures, and graduations required under these specifications shall be of such size, design, material, and location and shall be so applied or affixed that they will not tend easily to become obliterated or illegible.

10. All tanks and all devices designed to be attached thereto and used in connection therewith shall be of such construction that they are not designed to and may not be used to facilitate the perpetration of fraud.

Tolerances.—The tolerance to be allowed in excess or deficiency on all vehicle-tank compartments which are being tested by the weights and measures official for the first time to verify the accuracy of a capacity marked thereon by a manufacturer or user shall be the values shown in the column headed "On first test" in the following table. The tolerance to be allowed in excess or deficiency on all subsequent tests made by the official to verify the accuracy of a marked capacity shall be the values shown in the column headed "On subsequent test." These tolerances are to be applied to the difference between the actual result of the calibration and the marked capacity of the compartment. Whenever the result of a calibration indicates that the marked capacity of a compartment is not correct within the tolerance to be applied and the capacity of the compartment is adjustable, then the result of the calibration shall be taken as the basis of an adjustment, and the adjustment shall be so made that the capacity of the compartment agrees as nearly as may be with such marked capacity. When the capacity of the compartment can not be adjusted to agree with the marked capacity, then the compartment shall be remarked in accordance with the provisions of specification No. 8.

Capacity of compartment.		Tolerance.	
From—	Up to and including—	On first test.	On subsequent test.
Gallons.	*Gallons.*	*Gallons.*	*Gallons.*
.....	175	½	½
175	325	¾	1
325	475	1	1½
475	575	1	2
575	725	1½	2½
725	875	1½	3
875	975	1¾	3½
975	1,125	2	4
1,125	1,325	2½	5
1,325	1,500	3	6

(Signed) F. S. Holbrook,
W. F. Cluett,
R. F. Barron,
C. M. Fuller,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT.

The Chairman. It might be well to discuss these specifications section by section.

Mr. Siren. We have underground tanks in connection with which measuring sticks are employed. I think these people who build underground tanks should also receive a copy of these specifications and tolerances.

Mr. Holbrook. These specifications do not refer to underground tanks. The object of these specifications and tolerances is this: It is becoming in the United States more and more common to deliver gasoline to retailers by means of vehicle tanks. Formerly the gasoline was bucketed out of the vehicle tanks to the various stations. This is a slow process and not a particularly accurate one. It is now customary in many parts of the country—and it is becoming more common every day—to have the various compartments of the tanks labeled with the capacity contained therein when full and to hose directly the entire contents of a compartment to the underground storage tank, charging for the capacity of the compartment as marked upon the outside thereof. It is this practice which these specifications and tolerances are designed to facilitate.

Mr. Siren. How will you test them? With a meter?

Mr. Holbrook. The method of test is discussed to some extent in this report. Briefly it will consist of filling the empty compartment, by means of a 5-gallon measure, up to the indicator. This will determine the capacity of the compartment. Conversely, the tank may be filled to the proper point and the contents carefully bucketed into the 5-gallon measure until the compartment is empty, or both methods may be used, one as a check on the other.

Mr. Siren. That would be a very expensive process. Would not a meter be better for that purpose? By the use of water you could find its capacity very readily with a meter.

Mr. Holbrook. There is no expense except the time involved. It takes some time, of course. It may take as much as a day to check

out the various compartments of a large tank; but similarly it may take a day to test several wagon scales. One proposition is just as important as the other.

Mr. MATHEWS. Mr. Chairman, I would say for Mr. Siren's information the way we test a compartment is to measure in liquid until it is filled up to the proper point. We seal the tank by placing tags indicating the number of gallons each compartment will hold, and the driver sells the contents of each compartment according to the marked capacity.

Mr. SIREN. I do not know what you mean by indicators. We have no indicators on the tanks in our town; there is no specific filling point.

Mr. HOLBROOK. The specifications require an indicator.

Mr. SIREN. The filling point is determined when the vehicle stands on a level?

Mr. HOLBROOK. Yes.

Mr. EGAN. Mr. Chairman, it seems to me we are unnecessarily getting into a discussion of meters and all other kinds of appliances. I have in mind that as these specifications are considered a number of questions not exactly in line occur to us, but probably most of these questions will be cleared up before the discussion is concluded.

Mr. BARR. Mr. Chairman, I have had considerable trouble because tanks have no definite filling point.

Mr. SIREN. The reason I brought the meter up is because we get a fee for what we do, and the fee would be inadequate if we measured capacity by buckets.

Mr. ESTES. Mr. Chairman, it appears to me that we will get nowhere unless we limit our discussion to the particular specification read. I will make that as a motion.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(At this point a motion to adjourn was made and seconded, the question was taken, and the motion was agreed to.)

(Thereupon, at 12.30 o'clock p. m., the conference took a recess until 1.30 o'clock p. m.)

SIXTH SESSION (AFTERNOON OF WEDNESDAY, MAY 23, 1923).

The conference reassembled at 2 o'clock p. m., H. A. Webster, first vice president, presiding.

STANDARDIZATION AND SIMPLIFICATION.

By William A. Durgin, *Chief, Division of Simplified Practice, Bureau of Standards.*

Gentlemen: The matter I am to present to you is along the line of the particular interest of the Department of Commerce at this time. It really is approaching the work you have been doing for a number of years, but from a different angle. Your work is standardization; ours is simplification. Your efforts have been directed largely toward the elimination of fraud. Incidently, and quite as pertinently, they have been effective in the elimination of waste in this country.

This question of waste has been stressed in many ways, but I wonder if you realize the enormous influence it has in our present American industrial structure. I have a few slides which I think will help bring this out very plainly.

About four years ago, when the present Secretary of Commerce was president of the Federated American Engineering Societies, that organization, under his inspiration, undertook the survey of a typical group of industries to determine the avoidable wastes in our present methods.

The industries chosen were the building industry, men's clothing manufacturing, shoe manufacturing, printing, metal trades, and textile manufacturing. The surveys were made by expert engineers, some of whom are of international reputation. They contributed their time for six months. The results of the surveys were printed in a book entitled "Waste in Industry," by the committee on elimination of waste in industry of the Federated American Engineering Societies.

The avoidable wastes in these six industries ranged from 29 to 64 per cent. On the average, 40 per cent of all of the capital, labor, and material employed in these industries was wasted—spent with no return—or thrown away.

In the survey made by the lumber industry the report shows of 100 per cent wood in the tree about one-third gets worked into lumber, only 17 per cent gets into clear wood—a little bit less than a sixth of the tree gets into the finished product. If the tree were fully used there would be 25 per cent available for the finished product and 67 per cent available for pulp and distillation.

In presenting this matter of waste in industry I could give you the engineer's figure, and you would take it at its face value, but in my contact with the average business man I find that he discounts what the engineer gives. If the engineer says there is 40 per cent waste, the business man will say "That means only 20 per cent actual waste." I would reply, "Yes; I grant you that there is at least 20 per cent

waste." Now, what does that mean in dollars? The fabricated production in this country last year amounted to $50,000,000,000, and if there were only 20 per cent waste that means a waste of $10,000,000,000 throughout the country. We are all aware of the increase in taxes to $6,000,000,000. Secretary Hoover says, "Unless we can find that sum in our industrial structure we must lower American standards of living." Ten billions of dollars is not only enough to pay for all our taxes—Federal, State, and municipal, amounting to $6,000,000,000—but it will also pay for all the passenger automobiles built in 1922 and for the gasoline to run them, and we would still have enough to pay for all the homes built in America that year. Saving that $10,000,000,000 is the goal of that division of the Bureau of Standards which I represent, and I propose to prove to your satisfaction that the waste extends apparently in all industries. Many of your activities, in which you have been engaged in the past, have been directed against waste, but after all a great part of this waste is due to the lack of standardization. This is evidenced by the production of too many varieties in nearly everything we use. I wonder if you know how far it has gone in some industries. Here is an example from the hardware trade. We will take single-bit axes—something you associate with George Washington, Abraham Lincoln, and Theodore Roosevelt.

A survey of three manufacturers' lines was made by the National Retail Hardware Association. There were 34 types of models. Qualities or grades ranged from 1 to 4, brands ranged from 1 to 35, finishes ranged from 1 to 11, sizes ranged from 5 to 19, making a total variety in the 34 types actually purchasable of 6,118 and maximum possible variety of 994,840, from which it was possible for a buyer to make his selection.

A somewhat similar example is bottles. In a comparison of 62 different bottles or jars commonly used for packing food products we found 10 different shapes of 11-ounce containers, 4 sizes of 11½-ounce ones, and the odd part of it is that to look at them most of those having 11-ounce capacity appear to be larger than those having actually one-half ounce greater capacity. As a further example of how "looks deceive," one of the three sizes of 10-ounce containers when set among the 11-ounce bottles actually appears larger than any of the latter. All this variety is due to the spread of advertising propaganda. The advertising man has convinced his manufacturer that he can sell more by putting his product in special shaped bottles. There is no basis, in fact, to it at all, the brand being the chief selling factor; but the advertising man is so emphatic that he has sold the idea, and bottle manufacturers are now making bottles in 20,000 different sizes and shapes. As the bottle manufacturers figured up the number of molds and the stocks that resulted they began to take an interest in standardization. Their advertising men talk up the idea of bottles of unique and attractive size, but the manufacturer is now wondering if this is so important after all.

This [indicating slide] has very little interest from a waste standpoint, but the American flag should be made in definite proportions. There are 12 sizes, all having a common proportion, which were established by President Wilson for use by all Government departments, but our flag is made in nearly a dozen different proportions of length to width and in hundreds of different sizes.

Now, as against this tendency toward excessive variety, we of the bureau and of the Department of Commerce are attempting to spread the gospel of simplification and standardization. By "simplified practice" we mean the reduction of sizes and dimensions in commonplace things as a means, not of stopping a fraud, but more directly as the means of eliminating waste in all branches of production, distribution, and consumption through curtailing "overdiversification."

You men are early pioneers in this field. Here is a very definite simplified practice example. Under the standard container act grape baskets were reduced from 31 to 3 sizes, till baskets reduced from 30 to 5 sizes, and berry baskets reduced from 17 to 3 sizes. This is a reduction to approximately 15 per cent of the original number. That was a most economical thing to do, and well in the interest of the public.

We assume that through your activities this kind of simplification will be applied to some of the other types of food containers. We believe that simplified practice offers a particular advantage in that an approach to manufacturers and others from this angle oftentimes gets sympathetic reception, where the efforts of the Government to "regulate or control" might prove irritable.

Simplification will reduce investment and all costs of production. It will at the same time increase turnover, increase stability of employment, increase foreign commerce, increase quality of product, and increase profit to the producer, the distributor, and to the user. All these things come through simplification.

During the war many men came to realize that we had too many varieties in many lines, and it was decided to cut down on them. The cutting down was bitterly opposed, but, under the conservation program of the War Industries Board, a great many schedules were made effective. Varieties of farm implements were reduced from 1,092 to 137, thus eliminating all but 13 per cent of the previously existing varietics. The farm-implement manufacturers and engineers were bitterly opposed to that, but they had to give in because of the compulsion of war, and they now say that it was one of the most constructive things ever done for their industry.

One company had 12 styles of seats which they reduced to 1, and an assortment of 24 wrenches was reduced to 4. The agricultural-implement people have learned their lesson. They say simplification is a helpful principle to apply in business, and that it means the saving of millions of dollars to their industry.

Many of you remember in the early years of the twentieth century there were about 180 bases of incandescent lamps and a large number of different sized sockets. Then, if you endeavored to get a new lamp for your special socket, you had to repeat a specification almost as endless as that now required to secure parts for a machine tool. This variety has been reduced to six. What has been the result of all this? Well, now we can go anywhere and get lamps and they will fit the sockets. The manufacturer and the distributor have profited enormously by the decrease in stocks they formerly had to carry. The manufacturers say that this simplification of variety and standardization of type has saved millions for them, but perhaps the user benefited most of all in the greater convenience, economy, and comfort which it has brought to him.

Another instance of simplification is that of a large stationery manufacturer who reduced his stock of 377 kinds of bond, ledger, linen, writing, cover, typewriter, and book papers to 56, eliminating 321, practically reducing his line to 15 per cent of the original.

A great food manufacturer decreased the varieties of his food 89 per cent. He found he could decrease the cost of his sales force 73 per cent, advertising 78 per cent and overhead 80 per cent, and incidentally increase his sales volume 600 per cent.

Store fixtures is a line that you would think was particularly special—fittings, shelving, and counters. A certain firm offered unique and special designs. They said, "We will equip your store so that it will not be like any other in town. It will be highly individual." Despite the fact that they tried to have an exclusive line they found they could not make it pay. So, in seeking for ways and means to economize, they studied the idea of standardization and simplification. They decided to make only four designs of standard fixtures. At first the results were entirely what you would expect. The factory did not know how to handle a simplified and standardized line and sales seem to fall off, but as soon as they caught their stride sales increased 550 per cent.

A great shoe manufacturer reduced three grades of 2,500 styles each to one grade and 100 styles. As a result he decreased his production cost 31 per cent, reduced the direct overhead 28 per cent, reduced his inventories 26 per cent, and reduced the cost to the consumers 27 per cent. At the same time he increased his turnover 50 per cent, increased the sale of women's shoes 22 per cent, and the sale of men's shoes 80 per cent. Thus by this manufacturer reducing his line almost 99 per cent he greatly increased his business, and the consumer also was benefited.

Simplification can be carried on by individuals as well as by entire industries. The technical societies also are very much interested and are carrying it forward. There is nothing new in this idea which, as I said before, you started many years ago. The Master Car Builders' Association, which has been working forward during the past 40 years, has standardized and simplified the various parts of freight cars.

You do not have anywhere near the resistance you had in the early days, and if you will just include some of this commercial "selling talk" along the lines I have brought out I think you will find your progress easier.

There is a field in which the bureau has been working directly, viz, milk bottles—standardized milk bottles—standard from the legal point of view of a good full measure. The questions of filling point, standard height, and so on were definitely brought before the industry by the bureau. Finally, the manufacturers agreed to standardize heights of bottles as follows: 9, 9¼, and 9½ inches for quarts. Pints, half pints, and quarter pints are still made in wide variation, but we believe standards for them will be adopted in the course of a year. There is one question in standardizing the quarter-pint bottles that seems to offer difficulties. They tell us that in Boston the customer will not accept a quarter pint unless it is in a long, slim bottle, whereas in San Francisco they will not consider it unless it has a short, wide neck. Such are the peculiar vagaries of the people in different sections of the

country. In regard to caps for milk bottles we found they were using 29 diameters, and they now propose to use only one size for all sizes of milk bottles.

In another industry, namely, the manufacturing of paving bricks, the manufacturers got together and reduced their varieties 89 per cent by reducing 66 varieties to 7.

As you men meet these problems in your contact with industry we want you to appreciate that the spirit back of our effort is your spirit; that we recognize you as pioneers in the field; that we are all working together on this work. If, in this mutual effort, we succeed in eliminating any part of this $10,000,000,000 waste now in existence, we may all congratulate ourselves in having been associated in a worth-while job. Thank you.

The ACTING CHAIRMAN. We will again defer the discussion that was going on before luncheon and listen to an address by Dr. H. E. Barnard, director of the American Institute of Baking, on the subject "Divergence of bread-labeling requirements."

DIVERGENCE OF BREAD-LABELING REQUIREMENTS.

By H. E. BARNARD, *Director, American Institute of Baking.*

Mr. Chairman, ladies and gentlemen, friends, I do not know when I have listened to such addresses as I have heard to-day—the one by Herbert Hoover, and the one by Mr. Durgin, to whom we have just listened this afternoon.

I wish that those men who represent industry throughout the country could have listened to these talks. Certainly our Government is getting ahead in an amazing fashion when it can present to industry such technical talks as these. I am a bit embarrassed to have to bring you, as a layman, a discussion of my subject after having listened to Mr. Hoover and Mr. Durgin, but I come to you, not to tell you something this afternoon, but to get your help in finding a solution to a problem which is making a great deal of trouble for the inspector in the field and for the men in industry.

I am talking this afternoon because Mr. Holbrook asked me to bring this subject before you for discussion. Whenever out of my varied experience as a food official, weight and measure commissioner, and director of an institute of baking I can develop any helpful ideas for your study you may be sure that I shall not hesitate to obey your secretary. Indeed, I shall gladly take the position that any request to present any phase of the problem of bread distribution to the weight and measure officials of the country is really a command. If only every industry which operates over the scale would learn the value of cooperation with officials and how to make use of their services business would indeed be built on a more stable foundation and legislation and regulation under the law would be more easily secured and far more readily enforced.

When last I had the pleasure of meeting with you the subject of uniform bread-weight legislation and of uniform tolerances was in the hands of your committee. We have hope that uniform legislation might some time be an accomplished fact, and at a conference with members of your organization a year ago we endeavored to reach an agreement as to a form of legislation which would be acceptable to bakers and officials alike. You have read the report of that confer-

ence, and you were doubtless quite as disappointed as I that no results came out of it; but you have had enough experience in drafting legislation to realize, as I do, that sometimes opinions which clash most violently are, in fact, not far apart.

And this is certainly true of the type of legislation which we are here considering. No baker who appreciates the economic importance of his industry will hold that bread should be sold without regard to its weight or label. It is axiomatic among bakers to-day that the consumer is entitled to know who bakes his bread and how much his loaf weighs. The only points at which there can be any divergence of opinion have to do with the methods employed in informing the consumer of these facts.

A study of the law in question shows all legislation to be of very recent origin. Almost no legislation goes back further than 10 years. Most of it has been enacted since the war. The baker, perhaps, more than any other food producer, operated under the very stringent rules of the United States Food Administration, and out of the wreckage of individuality in business he emerged with a definite purpose to hold to that which is good even in the form of regulatory legislation.

So it is that law after law is being enacted to prevent the "return of stales," as the practice of taking to the bakery all unsold loaves is called, and that bakers are working with officials to secure the enactment of sanitary laws by which to compel the employment of healthy workmen and a strict observance of every rule of cleanliness that ever obtained in the kitchen of the careful housekeeper.

In the development of such legislation as that you enforce I appreciate the need for laws which are enforceable. If I may digress for a moment, I want to say to you, with all the earnestness of an ex-official now charged with the duty of helping a great industry right itself, that the trouble the food industries face is not a lack of law but lack of law enforcement. If every health official, every sanitary inspector, every food agent would only compel observance, your work and my work would, with the admirable health and sanitary laws which proudly grace the statutes and the ordinances of every city, be vastly simplified, the consumer would be spared the dangers of unclean and impure food and diseased workman, and the baking industry would have gained its rightful place in the sun as the most important, save that of the farmer, of all the industries.

But unfortunately too many of our laws are not enforced—funds are lacking, a trained personnel is unobtainable and, dare I say it, courts and officials sometimes weigh the political influence of offenders against the public well being and the scale turns against the consumer. I am informed that in the city of Chicago police judges have dismissed cases filed against insanitary bakeries with the statement "The people who trade with these bakers are accustomed to uncleanliness, they do not object to it, what are your inspectors bothering them for?" Obviously, judges who lay aside the law to excuse and condone violators are more dangerous to the public than dirty bakers; but fortunately such courts are in public contempt and always pass. Officials who meet such opposition are in hard lines, of course, and when the laws are so written that evidence is difficult to secure the burden of enforcement is doubly hard.

So it is that we must consider the handicaps of inspectors in drafting laws. I believe I have told you before this—certainly you know my views on the subject—that I would base all bread-weight legislation on the weight when figured back to a moisture-free basis. I believe that the consumer who is interested only in the amount of nutriment he buys and the bakers who endeavor to supply that nutriment in its most palatable and attractive form will both be better served by legislation which, in effect, says "the loaf of bread shall weigh 16 ounces as determined by adding 38 per cent of 16 ounces to the weight of moisture-free loaf;" that is, a loaf of bread weighed on a moisture-free basis, plus the legal moisture content, should weigh not less then 16 ounces or such other weight as may be designated by the label. Such a requirement would protect the consumer and do away with the necessity for tolerances which so often are but excuses for making 15-ounce pounds.

But I realize that the average weight and measure official has no laboratory at his command and so does not wish to work under a law which he has no means of enforcing. Is this lack of equipment, however, to keep him permanently on an unscientific basis? Should he not look foward to the development of a department so equipped that his work may be measured by an exact science rather than by arbitrary tolerances, time limits, averaging of determinations?

Of course, such a method of judging the purpose of the baker to make a full-weight loaf would have to recognize the inherent difficulty of exact scaling and of other mechanical losses of dough which tend toward ununiformity of weight both of the dough and the baked bread.

This question of tolerances I am content to leave in the hands of your committee, with the single suggestion that any requirement of absolute uniformity, which can be secured only at an added cost of production, must be avoided.

There is, however, one subject which is of mutual concern to baker, inspector, and consumer alike. That is the label. The first test of a label is, "Does it tell the truth?" the second is, "Is it legible?" the third is, "Is it practical?" And in answering these test questions bakers and officials sometimes disagree. There can be little argument over the truthfulness of a label, but there is as to its legibility. And to avoid misunderstandings and argument some States specify just what size and style of type shall be used. Six States, for instance, require the weight of the loaf to be set out in 8-point (brevier) capitals. This is the size and style of type usually required under the provisions of the food and drugs act, which antedates most weight and measure legislation, at least of the kind under consideration. The District of Columbia, however, requires the use of "plain bold-face gothic type not smaller than 12-point." Iowa requires "8-point heavy gothic capitals," the Virginia law says that the net weight of the loaf shall be printed "in letters and figures not smaller than one-fourth inch in height," and Illinois is now considering the passage of a bill requiring the use of "12-point full-face square gothic capital letters and figures."

In order that you might understand just exactly what the requirements are I have asked you and others who have information at your command to send me the data for your State and I have had

these data collected and printed. May I distribute it? I think, perhaps, I have enough for the whole conference.

(The following list of bread labeling requirements of the States and Territories of the United States was distributed):

BREAD LABELING REQUIREMENTS OF THE STATES AND TERRITORIES OF THE UNITED STATES.

In the list below the States having no special requirements as to style and size of type are set in 8 point type. Where a special type is required that style and size are used.

The list is a compilation of all available data.

Name of State.	Size and style of type required on bread labels.
Alabama	No requirements.
Arizona	(Only requirements) "Indelible letters and figures."
Arkansas	No requirements.
California	No requirements.
Colorado	No requirements.
Connecticut	"Plainly and conspicuously marked." (Pending bill, April 12, 1923, plain heavy gothic capital letters and figures.)
Delaware	No requirements.
DISTRICT OF COLUMBIA	"PLAIN BOLD-FACE GOTHIC TYPE, NOT SMALLER THAN 12 POINT."
FLORIDA	8 POINT (BREVIER).
Georgia	No requirements.
Hawaii	No requirements.
Idaho	"Plainly labeled with exact weight." (Other than standard loaves.)
ILLINOIS	"12 POINT FULL-FACE SQUARE GOTHIC CAPITAL LETTERS AND FIGURES. (Pending bill.)
INDIANA	"PLAIN TYPE" 8 POINT (BREVIER) CAPS, MINIMUM.
IOWA	8 POINT HEAVY GOTHIC CAPS. (At January, 1923, meeting of Iowa Association standard weight resolution was adopted, and officers and executive committee were authorized to prepare such a bill and have it presented to the legislature (then in session).)
Kansas	"Plainly labeled with exact weight" (if loaf is not standard).
Kentucky	No requirements.
Louisiana	No requirements.
Maine	No requirements.
MASSACHUSETTS	"8 POINT (BREVIER) CAPITALS."
Michigan	No requirements.
Minnesota	"Plainly and conspicuously marked."
Mississippi	No requirements.

MISSOURI	**"8 POINT (BREVIER) CAPITALS."**
MONTANA	**"8 POINT (BREVIER) CAPITALS."**
Nebraska	No requirements.
Nevada	"Plain, intelligible English words and figures." (Whenever weight is more or less than a pound.)
New Hampshire	"Plainly showing weight and manufacturer."
NEW JERSEY	**"8 POINT (BREVIER) CAPITALS."**
New Mexico	No requirements.
New York	"Plain statement printed on wrapper of each loaf" (if loaves not of standard weight).
North Carolina	No requirements.
North Dakota	"Plainly labeled with the exact weight, if bread is not 'full weight.'"
Ohio	"Plain statement in plain position."
Oklahoma	No requirements.
Oregon	No requirements.
Pennsylvania	No requirements in present law. (Pending bill April 16, 1923, "Plainly and conspicuously specified.")
Porto Rico	"Plain and intelligible English or Spanish words and figures with its correct weight and name of manufacturer." (For loaves not of standard weight.)
Rhode Island	"Plain and conspicuous."
South Carolina	No requirements.
South Dakota	"Plainly and conspicuously marked." (Twenty ounce loaves may be sold if "conspicuously" labeled on the wrapper "Not standard weight loaves, twenty ounces net.")
Tennessee	"Conspicuously, plainly, and correctly marked."
Texas	"Plainly and conspicuously marked."
Utah	"Plainly, showing correct weight and firm."
Vermont	"Plainly and conspicuously marked."
VIRGINIA	"Conspicuously affixed thereon a label on which shall be printed in the English language in letters and figures not smaller than one-quarter inch in height, the net weight of the loaf when baked."
Washington	"Plain English words or figures." (When loaves are not of standard weight.)
West Virginia	No requirements.
Wisconsin	No requirements.
Wyoming	"Plainly and conspicuously marked."

Thirty-nine States have no requirements as to the style and size of type required on the label. Is not the time opportune to determine just what form of label is best suited to the baker's use, and then as laws and regulations come into force to see to it that they are all of the same pattern? The baker is not interested particularly in the printer's art. He has no preference for gothic or any other style of type. He doesn't know what brevier means and doesn't care. He does, however, want to have such uniform legislation that a loaf of bread made and wrapped in Illinois will be legal when it gets to Wisconsin or Indiana. He doesn't want to have to carry in stock wrapping paper with one size and style of type for Illinois, another for Wisconsin, and another for Indiana. He can not see the need of legislation which compels him to invest his capital in special labels, in supervision of wrapping departments and of shipping clerks, in employing attorneys to keep him in the tortuous path which winds through the statute books.

Obviously, every added cost must be added to the price which the consumer pays for bread; obviously, too, this is an economic waste which should be prevented.

In an endeavor to meet the desire of your secretary in the preparation of this somewhat rambling paper, I sent out a questionnaire to all of the weight and measure officials whose names are on my lists. I asked these questions:

1. Name of State———————.
2. Name of department in charge of enforcement of laws and regulations governing labeling———————.
3. Does State have specific law requiring labeling of food packages with net weight of contents?———————.
4. If so, is copy of law or regulation inclosed?———————.
5. If copy is not inclosed, what is the requirement (*a*) as to size and style of type? ————; (*b*) phraseology?———————.
6. What tolerances are provided by statute?———————.
7. What tolerances are provided by regulations?———————.
8. When bread is sold unwrapped, is any label as to weight required?———————.
9. Under what conditions may bakery products be sold by numerical count?———— ————.
10. Has new legislation covering the sale of bakery products been enacted at the legislative session of 1923?———————.
11. In the event your State laws do not specifically require the use of type of definite size in declaring net weight will you, as the official in charge of the enforcement of such laws, adopt the standard size required by the Federal Food and Drugs Act, namely, 8-point (brevier) caps?————.
12. Signature———————. Date————.

The replies I received have been most helpful to me. I must confess, however, that some of our officials are apparently hedged about by secretaries whose desire it is to keep questionnaires from the desks of their superior officers. I have no hard feelings either for those secretaries or their "bosses." I remember very well how hard it used to be for me to sit down to answer unnecessary questions, especially when they were asked in the form of a questionnaire; but from the replies I did receive, supplemented by the splendid assistance rendered me by Mr. Holbrook and by the office of cooperation of the Bureau of Chemistry, I have collected on a single sheet the requirements as to size and style of type of all the States and Territories. The list is inaccurate, but it is the best I could prepare from questionnaires, laws, libraries, and the help of Messrs. Holbrook and Frisbie.

Won't you pity the poor baker who ships his product interstate and devise some plan of work by which such technical questions as these may be handled by a committee on uniformity which can work and act for all the States.

(At this point Doctor Barnard read the list given above in order to procure from the delegates present information concerning omissions or inaccuracies in the list compiled. The information brought out was as follows:)

Connecticut: "Plainly and conspicuously marked." (Pending bill April 12, 1923, plain heavy gothic capital letters and figures.) Before being enacted the latter bill was amended to require plain heavy gothic capital letters five thirty-seconds of an inch in height.

Illinois: Twelve-point full-face square gothic capital letters and figures. This requirement is incorporated in a pending bill.

Indiana: "Plain type" 8-point (brevier) caps minimum.

Iowa: 8-point heavy gothic caps. This was incorporated in a standard-weight resolution adopted by a meeting of the Iowa Association.

Louisiana: Bread must be wrapped and marked with weight, but standard loaves are not required.

Massachusetts: "8-point (brevier) capitals." These must be at least five thirty-seconds of an inch in height.

New Hampshire: "Plainly showing weight and manufacturer." By regulation the commissioner of weights and measures has required that the letters must be at least one-quarter of an inch in height.

New Jersey: "8-point (brevier) capitals." Proposed bills in New Jersey were defeated, and the State has no requirements.

This matter of type is but one instance among many of the need of cooperation between industry and officials in drafting legislation. These are not legal matters except as they require the services of lawyers and courts to find out just what legislatures in their wisdom were trying to say. They are purely technical questions to be worked out in conference and then translated into law. Speed the time when all such legislation is enacted with the help of the industries regulated and controlled by it.

To the end that every bill which may hereafter be introduced by you which in any way affects the baker or the baking industry may be sound in principle and practical in application, I offer you the assistance of the American Institute of Baking and of our national association in drafting it and in placing it on the statute books. May I then ask you to work with us in securing the enforcement of the sanitary and pure food laws which provide so admirably for the production of sound, wholesome food in sanitary shops, by healthy workmen, but which are too often so poorly enforced that they serve only to burden tthe conscientious manufacture by setting standards which are not upheld by his competitors.

Mr. STROBRIDGE. Mr. Chairman, do you expect to take up the question of specifications and tolerances for vehicle tanks? I think we ought to take up this subject before we get into a discussion of other subjects. You are now on a very interesting subject, but the other subject is one which can not be lightly passed by and I have a few suggestions that I would like to offer to the conference.

The ACTING CHAIRMAN. We will take them up after the next paper.

BREAD-WEIGHT LEGISLATION AND THE RETAIL BAKER.

By C. J. KREMER, *Representative of the Retail Bakers' Association of America.*

Mr. Chairman and gentlemen of the conference, needless it is to say that I deem it an honor to be here with you and deem it a courtesy to be here at the request of your arrangements committee, who asked me to come and speak to you.

Lest there be a misunderstanding, permit me to say I do not claim to speak for all of the retail bakers, but I do speak for a group of earnest, progressive, and sincere representatives of the retail bakers in many sections of the country.

Bread has been an important item in our civilization. It has been the chief food of many people, and it is rather difficult for us to understand how a food supply can be considered complete if it does not include bread. We learn from history that the profession of

baking was introduced into Rome before the Christian era began; the making of bread has engaged the attention of lawmakers since the earliest times. Bakers were considered as closely affecting public welfare in Rome at that time, and they were kept under rather stringent regulations. Coming down through history we find a law, which might be termed a standard bread-weight law, was enacted by the English Parliament, I believe in the year 1266. Not only were the weights regulated at that time, but also the prices, based upon the price of flour. If flour went up, bread went up; if flour went down, bread went down.

Then we find that similar laws were enacted in France, in the Netherlands, in Germany—in fact, all over the world. In recent years laws have become more and more numerous. Now, it is curious that during all these years a standard loaf has not been developed and generally accepted. I can not quite understand, since we have a standard pound and a standard bushel, why a loaf of bread does not mean very much. We do not know whether to expect 10 ounces or 5 pounds.

The question has come up, "What is a loaf of bread"? Is it simply a mass of dough that has been shaped by the baker and baked, or is it something definite? I think that in the mind of the American people to-day there is a conscious desire for standard weight. I know that a good many people are curious to know what a loaf of bread weighs and put it on the scales; and they are always disappointed. However, I do not intend to discuss with you whether or not there is a strong demand for bread-weight legislation, whether or not there is fraud and deception being practiced by bakers in the absence of bread-weight legislation, whether or not the public are being served better if bakers can change the weight of bread to meet fluctuating prices of materials and inherent qualities of bread because we have no coins sufficiently small to take care of these fluctuations and differences in quality. Nor is it my intent to go into details of various lines of bread-weight legislation proposed, such as whether or not a label stating the weight of bread, or selling bread by weight, or declaring the weight of bread in some other manner, is to be preferred.

Another phase I do not intend to discuss is whether or not it is useless and inconsistent to set weight standards for bread without providing for quality standards, as loaves of standard weight might be less nutritious and less beneficial to the public than loaves below the standard weights.

I am assuming, and I think justly, that there is a genuine desire on the part of the public who have given the matter any thought, for bread-weight legislation. It is not reasonable to believe that from the thirteenth century down legislatures in England, France, the Netherlands, Germany, down to New York, March 2, 1812, Louisiana, 1807 to 1816, Alabama, 1826, were all in error and passed laws for which there was no demand, or when there was no evil to remedy, to say nothing of the numerous State laws and city ordinances enacted in modern times. I believe that the people of this country earnestly desire bread-weight regulations, and, what is more, I believe they are going to have them.

There is a natural and, perhaps, laudable impatience in the American business man, and bakers are no exceptions, with the interference

in to what he considers his private affairs on the part of Government agencies, be they Federal, State, or municipal. Many years ago a prominent baker right here in this city voiced his opposition to a bread-weight law then under consideration in the following words: "One of the reasons we object is that it (the bread law) is an unwarranted and unwarrantable arbitrary and unnecessary interference with and invasion of the right of citizens to pursue an ordinary calling."

However, retail bakers, whom I have the honor to represent, do not feel as bad about such regulations as that speaker, who was a baker of millions of loaves, would have us believe he did. We come in closer contact with bread consumers and are, perhaps, more ready to appreciate the other fellow's viewpoint. We are not only willing but eager to give full value to our customers, and if you look in your dictionary for "baker's dozen" you will find the term defined as 13, while the dozen of any other tradesman means only 12. I am sure that no wholesale baker's dozen was ever 13 and that, only because of retail bakers, we now find that definition in our dictionaries. The chief concern of the men whom I represent here to-day is that such regulations as may be adopted should be practical, plain, fair, uniform, and enforceable. We willingly waive certain abstract rights we may have and which may be turned to pecuniary advantage for the sake of public welfare. However, we do not want any legislation that may be an instrument for harrassing us when we are acting in good faith.

Our ideas as to bread-weight legislation may be summarized as follows:

1. It must express sound public policy in the making and selling of bread. If framed with the idea that bakers are dishonest to a greater extent than other people, it is likely to fall short in that particular.

2. It must be practicable; that is to say, it must be possible to comply with requirements without unduly increasing cost of manufacture or other undue burdens.

3. It must be based upon fairness and not capable of being used to trap and penalize bakers who have no intent of violating any provisions and use good commercial practice in their shops.

4. It must be positive and definite, plain and unambiguous, and so framed that it can be readily understood and its meaning not subject to quibbling or misconstruing.

5. When it is local, it must take into account that bread may be manufactured for or in places where no regulations or different regulations prevail. It must be enforceable, as an unenforceable law is detrimental to sound public policy and tends to penalize conscientious law-abiding citizens and to bring all law into contempt.

To meet these specifications it is necessary that all factors having to do with the weight of bread must be considered and their importance valued correctly. Perhaps the first one is that the weight of loaves of bread must be determined before they are loaves and before they are bread. In other words, a guess must be made by the baker what a certain mass of dough will weigh after it is shaped into a loaf and baked into bread. It must be self-evident that absolute accuracy is impossible. Then, when the dough is weighed, the ever-present factor of error on the part of the men at the machine or the scale,

and the unavoidable inaccuracy of mechanical devices come into play and must be reckoned with.

There is a slight loss due to fermentation between the weighing of the dough and the baking of it into bread. In the bake oven a loss of weight takes place which is dependent upon the ingredients in the dough, the kind or type of bread to be baked, the size and shape of the individual loaves, the temperature of the oven, and time taken for baking.

Bread may come out of the oven at a certain weight, but that weight is unstable. The loaves begin to evaporate at once and in different ratios. They lose and continue to lose weight for some time; in fact, until they are quite dry and stale. The rate of this loss is not uniform but is dependent upon the humidity of the surrounding atmosphere, shape, size, and composition of loaves and other factors. Two loaves of exactly equal weights when baked may show a marked difference 36 or 48 hours after baking.

These conditions can not be ignored, but must be squarely met in framing acceptable bread-weight legislation. However, they should not be exaggerated to make it appear that fair and equitable legislation is impossible.

I am frank to say that most of the laws that have come to my attention are not meeting the issues in a satisfactory manner. I am of the opinion that labeling of loaves with the weights thereof, which never can be accurate but must be minimum, does not meet the expectation of the public and is of little practical value. We had experience with such regulations years ago, and many retail bakers are of the opinion that the affixing of labels is an unnecessary added expense and from the standpoint of sanitation can not be recommended.

To my mind the only solution which meets the situation, is not unfair to bakers and gives adequate protection to the public, is legislation establishing standard weights for loaves. Such legislation can be worked out along the lines mentioned before, and when I speak of bread-weight legislation hereafter I want to be understood as meaning standard-weight legislation.

How is weight to be ascertained? Now, if we go back to factors that must be taken into account there is the weighing of bread as dough to be considered. This, especially in many retail shops, is done in a hurried manner. Bakers know from experience that if they want loaves weighing 16 ounces when they come out of the oven they must weigh the individual pieces of dough which are to be shaped into loaves 17½ to 18½ ounces. Of several hundred loaves weighed, even by careful, competent men, a certain percentage will be above and others below the intended weight, but they ought to average rather well. There is one point I wish to bring out right here. The man weighing the dough, if attentive, becomes quite an expert in estimating the weight of the piece he cuts from the mass to be formed into individual loaves, but he often misjudges, and when placing the pieces on the scale finds that he must take a portion from one or add to another. Pieces of supposedly correct weight then are placed on a table where they accumulate and are later molded into loaves. It may happen that the portion added becomes detached again or adheres to another piece which is of full weight and for which it was not intended. Even in shops where a modern divider is used the machine may deliver

some pieces of abnormal weight which are not caught by the man in charge. Now, I submit that it would not be fair to penalize a baker for freak individual loaves brought about in the manner described. Legislation, to be fair, should provide that the weight of individual loaves should be determined by the average weight of a number of loaves.

It might be argued that if weights of pieces of dough were to be rechecked with sufficient care this item would be eliminated. This is, perhaps, true, but such checking would not only increase manufacturing costs but also tend to affect the quality of bread adversely, bread would not be uniform, some pieces might have to be discarded; checking after molding would throw the whole working schedule of the shop out of adjustment and would be an expensive proposition.

Granting, now, that the weights of individual loaves should be computed from the weight of a certain number of loaves, the other factors which influence the weight of bread, such as loss during or after baking or while being marketed, may be taken care of by tolerances. What the tolerances ought to be should not be left to the opinion of any one man or group of men, but should be based upon carefully recorded experience in actual trade and merchandising practice. Tolerances should not be made haphazard or by guesswork. They should be based upon honest, good, commercial practice, and especially in new legislation should be liberal. If working experience with them shows that they are taken advantage of in that there is a tendency to work toward the minimum rather than the standard on the part of bakers, they ought to be narrowed.

When should bread be weighed? Granting now that there ought to be bread-weight legislation, granting how the weights of individua-loaves are to determined, granting that there are reasonable tolert ances, and granting that bread constantly loses weight so that il might be within the tolerances at the time of weighing, and some hours afterwards below them, the question naturally presents itself, When should the weight of bread be determined?

In dealing with this proposition we find some bread-weight legislation provides that loaves must be weighed within a certain fixed period after baking, ranging from 8 to 36 hours in different laws. Now, as I see it, the injection into a law of a time element when bread is to be weighed is ill-advised and practically defeats the purpose of bread-weight legislation. With a provision as to certain hours within which bread must be weighed, a law will not protect the people, will be practically unenforceable to a great extent, will be discriminatory in favor of certain bakeries within and without its jurisdiction, and will be unfair in its application.

As a practical proposition it would not be possible to check weights of loaves of bread made from thousands of batches of dough in the great number of bakeries in the country every day within certain hours after baking, unless a large army of inspectors were to be employed and available for service any hour of the day or night. In many bakeries several thousand loaves are baked every hour, some by day and some by night; they are cooled, wrapped, and placed on racks, packed into shipping containers, or left to accumulate, and finally loaded on trucks to be distributed over a large territory. There are special ovens which, when running, deliver from 50 to 100 loaves every minute, hour after hour day or night. These loaves are

cooled on traveling devices, machine wrapped, and placed in racks. In these establishments it would be impossible to determine when the stated hours within which bread is to be weighed expire unless the loaves were marked for identification as they leave the ovens, and, again, on the wrapping machines, for after cooling and wrapping, or even without wrapping, they soon lose their identity among hundreds or thousands of others and could not be recognized even by the persons who took them from the ovens.

In smaller bakeries loaves do not lose their identity to the same degree nor in so short a time, but much bread is loaded on to trucks within a few hours after baking, and no one not familiar with the history of the loaves could be certain as to how many hours they have been baked. In a retail shop where a limited number of loaves are baked once or twice a day and all remain on the premises until sold in the store it might be possible for inspectors to effectively check weights with some degree of accuracy, but it is not fair to enact a law that is enforceable on small bakers only, and thus confer a special privilege on some.

In small communities where there is a local baker bread could be shipped in from distant points to which the law could not be applied, as it could not be proven when it was baked; but it would be enforceable against the local man and subject him to most unfair competition. In no case where bread is brought into, say, Wisconsin, from other States would the law be enforceable. It would penalize those bakers in Wisconsin against whom it might be invoked and thus discriminate in favor of bakers located in other States, violating just legislative principles.

In the enforcement of the law so many difficulties would be encountered that it would be hard to obtain convictions. The prosecution would have to prove every element of the offense, including the fact that the bread when weighed had been baked less than the stipulated hours. No one—not the most experienced inspector nor even the baker himself—would be able to testify under oath whether bread which had been baked within 10 or 12 hours, had been wrapped, and had reached and maintained the temperature of the surrounding atmosphere in a truck, market, or store had or had not been baked within 24 hours unless he knew the history of the particular loaves. If the prosecution is unable to get positive evidence, there can be no conviction, and loaves, no matter what their weight, and even if made with the direct intention to defraud, would escape the provisions of the law, and the dishonest baker and vendor thereof would be immune.

The principle that bread must be weighed at a time which may be 1 or 2 or 3 days prior to the time it is sold to the public is unsound. The logical time when bread should be of standard weight is any time up to and including the time when it is offered for sale and sold to the public. If standard loaves are to mean anything, the purchaser has a right to expect, and is entitled to, a standard loaf at the time of making purchase.

This leads inevitably to the conclusion that the party who offers the bread for sale and sells it, whether it is the baker who manufactures it or a merchant who merely deals in bread, must be held responsible for its weight. It is the duty of the seller of any articles of food to exercise the care necessary to have the articles he sells of

a lawful character. This is in conformity with all our food laws. If this is applied to standard-weight bread, it behooves the merchant to check weights sufficiently often to know that the loaves he offers are within the tolerance. The Ohio supreme court says; "It compels the seller to know and be certain." If the baker from whom he buys does not allow sufficient margin for shrinkage another one will. Of course, it is clearly understood that at any time a baker, whether wholesaler or retailer, who bakes, offers, or sells bread not within the tolerances is amenable to prosecution. The purchaser at the time he buys bread is justly entitled to a lawful loaf, the seller who takes his money is directly responsible and ought to be made to squarely face this responsibility and never be permitted to hide behind the skirts of a baker, who may live in another city or State and may not be within reach of enforcing officials.

It is necessary that bread-weight legislation take notice of bread which may have been within the tolerance when it was baked and for the time in which it is usually sold afterwards but was not sold during this period and has evaporated to a degree that it is no longer standard. It is safe to say that there is a definite, not to say parallel, relationship between the loss of moisture and what is termed staleness in bread. The actions and changes involved in "staling" are not clearly understood by scientists of the present day, but it is not unreasonable to assume that, with the evaporation of moisture, there also escape certain aromatic, flavoring principles or properties characteristic of good, fresh bread.

Whatever the changes may be, whether "staling" is due to a reconversion of starchy particles or to other not clearly defined causes, the fact remains that, when normal bread, made in compliance with the spirit of bread-weight legislation, has evaporated sufficiently to bring it below the allowable tolerance in weight it is no longer normal bread, but stale bread and should be sold as such. Stale bread when offered for sale and distinctly sold as and for stale bread should be exempt from the provision of weight laws. This will open a channel by which sellers of bread may lawfully dispose of bread that has lost sufficient weight to bring it within the proscribed class.

I would not undertake to say that an absolutely uniform law would be right and fair for every section of the country. While the smallest unit in one part of the country might very well be 1 pound, I can see where in certain localities one-half pound might serve best a large class of consumers. Laws should provide for bread in such weights as will best serve the public, but the difference between standard loaves must be sufficiently large to be evident and conspicuous. Legislation should be so framed as to permit bakers to bake bread of such weights as will enable them to compete with bakers in places where there is no law or a different one. It would be unfair for any State to prohibit bakers to bake bread in loaves of any weight which might be lawfully sold in an adjoining State, especially in cities along the border lines.

I do not underestimate the desirability of uniformity of legislation in all States, but effective and just legislation is more to be desired than mere uniformity. I am mindful that complications might arise under the interstate commerce law. It appears to me that the sale at retail of bread and other products of retail bakers should be primarily a field for State regulation, which should not be occupied

by Federal authority so as to interfere with or hamper enforcement of laws relating to articles sold for use and consumption within a State.

In conclusion, let me again thank you in behalf of the retail bakers. Not only will we gladly submit to and work with lawful requirements relating to the protection of the public health, safety, or welfare, but in a spirit of loyal citizenship we will not permit our selfish interests to constitute obstacles to a greater public welfare or be in the way of "whatever will promote the general convenience or the general prosperity."

Our dreams are not to build vast commercial enterprises reaching from ocean to ocean, but so to conduct our modest establishments that, when our work is ended, the American people can truthfully say to us: "Well done, thou faithful servant"!

DISCUSSION OF PRECEDING PAPERS.

The ACTING CHAIRMAN. I feel sure that Mr. Kremer and Doctor Barnard will both be glad to answer any questions you may wish to ask.

Mr. EGAN. Mr. Kremer, I am opposed to the exclusion of marking on a standard loaf.

Mr. KREMER. If you have a standard loaf and, in addition, want to mark it, I do not see any objection to it nor any advantage to be gained.

Mr. EGAN. Would you be in favor of a statement on the loaf showing the ingredients of the loaf?

Mr. KREMER. I am afraid that would open too wide a field. You could not check whether that was correct or not. For that reason I would oppose it.

The ACTING CHAIRMAN. How do you feel about that, Doctor Barnard?

Mr. BARNARD. I do not think it is a matter for legislation. I would be very glad to see it done, but I do not believe we have reached that time yet. It would be impossible to check that statement, to prove or disprove it.

The Department of Agriculture has adopted a standard that requires that milk bread shall be made with at least 33⅓ per cent milk. That was the first effort made in this country to standardize milk bread, but we have not reached the point where we can go any further than that.

Mr. EGAN. I would like to say, Mr. Chairman, that in Connecticut we have been driving for weight marks on loaves of bread and for a standard loaf ever since 1913. We were not able to have a new law enacted until 1921. The bakers then appeared before the judiciary committee and the bill as reported out was agreeable to the bakers and their representatives. One of the legislators on the day that the law was up for final consideration or passage offered an amendment, as a result of which we had what they called the "alternate loaf." We had some trouble with the law and the attorney general ruled that all bread should be marked by the true weight, but that standard bread need not be made. At the present session of the general assembly the bakers again appeared before the judiciary committee and advocated a change in the 1921 law, and then they came to the

weights and measures office with the information that they wanted to aid and work in harmony with us. Afterwards they employed a representative who had the same law reported, and I think it will be passed.

The only difference will be in the style of marking, for this reason: After the 1921 law was put into operation the weight marks were indistinct in many cases; in some other cases they were put on the union label, which was not objectionable in itself, but it resulted that it was not plain nor conspicious. For that reason we have this year put in a requirement that the weight should be in type of a certain size, something like that required in the Massachusetts law, large gothic. We have not had any trouble with regard to bread weight. The words in the former law, "twelve hours after baking" have been changed so that the present law specifies "twelve hours after delivery." Within 12 hours after delivery loaves shall not vary more than 1 ounce per pound, but 12 loaves, picked at random, shall aggregate the total fixed amount.

The Acting Chairman. Mr. Dale left a note specifying that the allowable moisture content might be regulated. He also mentions that the moisture content of textiles has been regulated since the middle of the eighteenth century.

Is it the desire of the conference to take up the report of the committee on bread legislation, which is the next number on the program, or is it your pleasure that we should return to the discussion of the specifications and tolerances for vehicle tanks, which took place before luncheon?

(It was ascertained by a vote that the desire of the conference was to proceed with the report in relation to bread-weight legislation.)

Mr. Holbrook. As the only member present of the conference committee on bread-weight legislation and tolerances, it devolves upon me to submit the following report. The committee submitted this report by mail to the delegates to the Fifteenth Annual Conference on Weights and Measures. It seems it should be read into the record at this place in order officially to close up the duty of that committee.

REPORT OF CONFERENCE COMMITTEE ON BREAD-WEIGHT LEGISLATION AND TOLERANCES, PRESENTED BY F. S. HOLBROOK.

Your committee appointed at the Fifteenth Annual Conference pursuant to a resolution of the conference that a committee of three be appointed to meet with a similar committee representing the baking industry to attempt to negotiate a model uniform bill on bread weights and tolerances on bread loaves mutually satisfactory to weights and measures officials and to the baking industry, respectfully submits the following report:

A meeting was arranged to be held in Detroit, Mich., at the Hotel Statler at 2 p. m. on August 16, 1922. The three members of your committee held a preliminary meeting to decide upon procedure and then went into joint conference with the committee representing the baking industry.

The following representatives of the baking industry were present: Dr. H. E. Barnard, business manager, American Bakers Association, Chicago, Ill.; Dr. R. M. Allen, Ward Baking Co., New York, N. Y.; Jay Burns, president, Jay Burns Baking Co., Omaha, Nebr.;

George S. Ward, president, Ward Baking Co., New York, N. Y.; C. J. Kremer, Milwaukee, Wis. (representing the National Retail Bakers Association); and Ellwood M. Rabenold, of New York, N. Y., general counsel American Bakers Association. It was stated that the first three named representatives should be the voting members of the bakers' committee.

SUMMARY OF PROCEEDINGS OF JOINT MEETING OF COMMITTEES.

The joint committee organized by the election of John M. Mote as chairman of the meeting and Dr. H. E. Barnard as secretary of the meeting.

The first definite proposal was made by the bakers' committee and was, briefly, to the effect that bread should be sold on a basis of the moisture-free content of the loaf, with the understanding that the moisture content should not be in excess of 38 per cent, this being the value fixed in the tentative bread quality standards recently issued for discussion by the joint committee on standards, United States Department of Agriculture.

The bakers' representatives urged that this was the most fair and equitable way to sell bread, being based upon the food content of the loaf, which is the most important factor; further, that this method would eliminate the importance of shrinkage, since the moisture-free content would remain the same at all times.

Your committee replied that, in their opinion, the proposal was impracticable, since it would be a sale upon such a basis that the weight could not be checked by the purchaser, and it would introduce new and complicating factors into the enforcement of weights and measures laws, since practically no violation could be proven without a chemical analysis of the loaf. Other commodities are not so sold, although there are many manufactured products in which water is present in the finished product—flour and butter, for example—and many natural products sold by weight contain very large percentages of moisture.

After discussion your committee took the ground that such a method of sale would be unsatisfactory to weights and measures officials.

Much discussion followed on the general question of standard-weight loaves and tolerances for bread. Finally, Mr. Rabenold read and placed before the meeting for consideration a bill modeled upon the present bread law in Massachusetts. Among other things, this provided that bread should be sold either in standard-weight loaves or in loaves of any other sizes provided these were either properly labeled with their weight or, in the case of sale at retail upon the premises where produced, provided there was a representation by means of a sign posted adjacent to the bread showing the weights of the various sizes and kinds of bread sold in the bakery.

Your committee at once took the position that it did not consider itself at liberty to negotiate any legislation which did not require standard weights in every case, since it considered itself bound by the action of the Fourteenth Annual Conference on this matter. The representatives of the baking industry on their part did not feel free to commit the industry in any way to the standard-weight principle. After much discussion on these viewpoints it became apparent that

no agreement on legislation was possible. Thus, the first purpose of the joint meeting of committees definitely failed.

Your committee then urged that the question of tolerances be given consideration, and that some constructive action be taken on this subject. Some of the bakers' representatives were in favor of such a discussion, but Mr. Rabenold was opposed to this procedure, since he urged that the bakers would then be assisting in the formulation and perfection of proposed legislation which would be introduced in the form of a standard-weight bill. Your committee agreed that the tolerances would be so used in some cases, but pointed out that reasonable tolerances when arrived at would be equally applicable to bread whether in standard loaves or not.

The joint meeting then recessed to allow a decision of the bakers' committee on the procedure to be followed in respect to tolerances. The bakers' representatives were requested by your committee to bring in recommendations on three points, namely, (1) size of tolerances, (2) number of loaves necessary to obtain a fair average weight, and (3) time after baking within which bread should be weighed. On the last point your committee reserved the right to discuss whether or not a time limit in hours should be set on account of difficulty of proof as to the time when any bread had been removed from the oven.

Upon the reassembling of the meeting the bakers' representatives submitted to your committee a bill which was said to be satisfactory to the baking industry and asked for it the careful future considera- of your committee.

Upon the question of tolerances they stated that tolerances were provided for in the bill submitted, and that they would stand on the recommendation therein made.

There being no further business to come before the meeting, adjournment was taken subject to the call of the chairman.

SYNOPSIS OF PROVISIONS OF BILL SUBMITTED BY BAKERS' COMMITTEE.

The basis of the bill finally submitted by the bakers' committee is the Massachusetts bread law, with several amendments:

Section 1 provides for the sale of bread in standard-weight loaves, said weights to be determined not more than 12 hours after baking or delivery to retailer on the average weight of 6 loaves, or 12 loaves if available.

Section 2 exempts rolls and fancy bread weighing less than 4 ounces and also exempts from the standard-weight requirement all bread the weight of which is represented upon the wrapper or, in the case of unwrapped bread, by a label or a pan impression upon the loaf, or, in the case of any bread sold at retail, upon the premises of the manufacturer by a notice posted in close proximity to the bread, setting forth the weight of each size and variety of loaf sold.

Section 3 provides for rules and regulations to be made by the State official and to include tolerances, the seizure of bread deemed to be in violation of law, and for an appeal by the baker to the State weights and measures official before prosecution. It is provided that the tolerance shall not be less than 1 ounce per pound under the standard unit or represented weight.

Section 4 provides a penalty of not more than $100.

Naturally your committee can not agree with the principle embodied in this bill. Not only may bread be sold in other than standard-weight loaves, but the tolerance is believed to be excessive. The tolerances rejected by the Fifteenth Annual Conference on the ground that they were too large are very much smaller than those proposed here.

Briefly, the tolerances recommended at the conference provided that on the average weight no tolerances in deficiency be allowed up to time of delivery to retailer and one-half ounce per pound in deficiency thereafter and up to the time the bread was declared to be stale and sold as such. The tolerance in this bill is a minimum of 1 ounce per pound in deficiency on the average weight at any time after removal from the oven and up to 12 hours after delivery to retailer. Following this time when in the hands of the retailer this tolerance may be exceeded whether bread is being sold as fresh bread or not.

RECOMMENDATIONS IN RE BREAD LAWS.

The necessity of having a model bread law ready for introduction during the coming sessions of the legislatures of the various States was pointed out at the last conference. It was hoped that some legislation satisfactory to the weights and measures officials and the baking industry might be framed at the joint meeting reported above. In the failure of this your committee recommends the introduction in the various jurdisdictions not already having a satisfactory law of the model bread law adopted by the Fourteenth Annual Conference on Weights and Measures, with additional provisions if there are any such that are believed to be necessary or desirable to make the bill more readily applicable to particular local conditions. For example, it has sometimes been thought advisable particularly to enumerate the titles of the officials who are to be charged with the enforcement of the law and specifically to provide for the seizure for use as evidence or the confiscation of bread not complying with the provisions of the law.

(A copy of the model law as adopted is attached hereto for your information.)

Many States now have the general model law on weights and measures recommended by the conference or a similar law, either with or without the bread section, now obsolete, contained in that law. In these cases it may be desired to adopt the present recommendations for the sale of bread by adding a section to this general law or by modifying the present section, rather than by the passage of the special bread law mentioned above. If so, this object can be accomplished by incorporating a new section in the law similar to the section adopted and recommended by the conference for this purpose, a copy of which is attached hereto.

RECOMMENDATION IN RE TOLERANCES.

The general position taken by the conference was to the effect that tolerances on bread to be recommended to the various officials are very necessary and should be agreed upon as soon as possible. Your committee concurs in this attitude, and in the failure to negotiate satisfactory tolerances with the baking industry proposes to procede upon its own initiative in an attempt to frame satisfactory tolerances. If a conclusion can be arrived at, this will be sent to the delegates attending the Fifteenth Annual Conference and a letter ballot taken upon them. If approved upon such ballot, the proposed tolerances

will be circulated as the expression of the conference upon the subject. In this way it is hoped that they may be available for use before the coming meetings of the State legislatures.

Respectfully submitted.

(Signed) JOHN M. MOTE, *Chairman*,
JOHN J. CUMMINGS,
F. S. HOLBROOK,
Committee on Bread-Weight Legislation and Tolerances.

MODEL BREAD LAW ADOPTED BY THE FOURTEENTH ANNUAL CONFERENCE ON WEIGHTS AND MEASURES.

SECTION 1. That the standard loaf of bread shall weigh 1 pound, avoirdupois weight. All loaves of bread manufactured, procured, or kept for the purpose of sale, offered or exposed for sale, or sold, in the form of loaves, shall be of this standard weight, or of one of the following weights, and no other, namely, one-half of such standard weight, one and one-half times such standard weight, or in multiples of such standard weight: *Provided, however*, That the provisions of this act shall not apply to biscuits, buns, crackers, rolls, or so what is commonly known as "stale bread" and sold as such, provided the seller shall at the time of sale expressly state to the buyer that the bread so sold is "stale" bread. When twin or multiple loaves are baked, the weights specified in this act shall apply to each unit of the twin or multiple loaf.

SEC. 2. That the enforcing officer shall enforce the provisions of this act. Rules and regulations for the enforcement of the provisions of this act not inconsistent therewith shall be made by the enforcing officer, and such rules and regulations shall include reasonable variations and tolerances, in excess and deficiency, which may be allowed.

SEC. 3. That it shall be unlawful for any person to manufacture, procure, or keep for the purpose of sale, offer or expose for sale, or sell, bread in the form of loaves, which is not of one of the weights specified in section 1, within such variations and tolerances as may be fixed by the enforcing officer. Any person who, by himself or by his servant, or agent, or as the servant or agent of another, shall violate any of the provisions of this act shall be guilty of a misdemeanor and shall be punished by a fine of not less than $25 nor more than $200, upon a first conviction in any court of competent jurisdiction; and upon a second or subsequent conviction in any court of competent jurisdiction he shall be punished by a fine of not less than $50 nor more than $500, or by imprisonment for not more than six months, or by both such fine and imprisonment, in the discretion of the court.

SEC. 4. The word "person" as used in this act shall be construed to import both the plural and the singular, as the case demands, and shall include corporations, companies, societies, and associations.

REVISED SECTION ON BREAD TO BE SUBSTITUED FOR BREAD SECTION FORMERLY INCLUDED IN MODEL STATE LAW ON WEIGHTS AND MEASURES.

(To be numbered sec. 26 in form No. 2, sec. 18 in form No. 1, and sec. 24 in form No. 3.)

The standard loaf of bread shall weigh 1 pound, avoirdupois weight. All bread manufactured, procured, made, or kept for the purpose of sale, offered or exposed for sale, or sold, in the form of loaves, shall be of one of the following standard weights and no other, namely, 1 pound, one-half pound, 1½ pounds, or multiples of 1 pound, avoirdupois weight: *Provided, however*, That rules and regulations for the enforcement of the provisions of this section not inconsistent herewith, shall be made by the superintendent (commissioner), and such rules and regulations shall include reasonable variations or tolerances, in excess and in deficiency, which may be allowed: *And provided further*, That the provisions of this section shall not apply to biscuits, buns, crackers, rolls, or to what is commonly known as "stale" bread and sold as such, in case the seller shall at the time of sale expressly state to the buyer that the bread so sold is "stale" bread. When twin or multiple loaves are baked, the weights specified in this section shall apply to each unit of the twin or multiple loaf.

It shall be unlawful for any person to manufacture, make, procure, or keep for the purpose of sale, offer or expose for sale, or sell, bread in the form of loaves which is not of one of the weights specified in this section within such variations or tolerances as may be fixed by the superintendent (commissioner) as provided herein.

Mr. HOLBROOK. I might add to that report the fact that within the last six months three States—and more may be added before the legislatures adjourn—have adopted a standard-weight bread law. They are Washington, North Dakota, and Wisconsin. Illinois is now considering such legislation, and other bills are pending.

There should also be read into the record the supplementary report of the conference committee on bread-weight legislation and tolerances, which was also submitted by mail to the delegates attending the Fifteenth Annual Conference on Weights and Measures.

SUPPLEMENTARY REPORT OF CONFERENCE COMMITTEE ON BREAD-WEIGHT LEGISLATION AND TOLERANCES, PRESENTED BY F. S. HOLBROOK.

Some time ago the annual conference committee on bread-weight legislation and tolerances submitted a report on the results of a joint meeting of committees held on August 16, 1922, in Detroit, Mich. Supplementary to this report your committee now desires to advise you that shortly after the conference held in Detroit, C. J. Kremer, who represented the Retail Bakers' Association of America at the conference, addressed a letter to F. S. Holbrook, the Bureau of Standards representative on the committee, requesting that the arguments of the officials in favor of the standard-weight loaf be furnished him in some detail. He stated that in reporting the Detroit meeting to his association he desired to be in a position fairly to report both sides of the case for consideration. In accordance with this request, data in the hands of the committee and of the Bureau of Standards was furnished.

Some time ago we received a letter from Mr. Kremer, in which he stated that he had laid the "model bread law" before the members of the Wisconsin Association of Master Bakers at their convention and also before the National Retailers Association at Chicago. Both of these organizations indorsed the principle. There was, he stated, some difference of opinion as to details, and there was a minority who were against the proposition.

In relation to the action taken by the retailers at their National Convention, the October, 1922, issue of the Bakers' Review contains the following:

* * * Charles J. Kremer, of Milwaukee, who represented the retail bakers at the conference held in Detroit with the sealers of weights and measures on the model bread law, presented his report of what took place at the meeting.

* * * The sealers asked the bakers to agree among themselves on tolerances and on the number of loaves that should be weighed in order to arrive at a fair average weight. It immediately became evident that the bakers differed on essentials and could agree on no common ground. Mr. Rabenold advised against the bakers committing themselves, and suggested the submission of a bill of their own, taking the Massachusetts law as a model. * * *.

The sealers demanded a standard-weight loaf of bread, but the bakers, on the other hand, refused to recognize the right to impose standards.

Speaking for himself, Mr. Kremer expressed the belief that the agitation for a standard loaf would be carried on, as the sealers were determined to secure a standard, and he personally doubted the wisdom of opposing them. He thought it would probably be better to make friends with the sealers and with the women's clubs by agreeing to standards.

STANDARD LOAF APPROVED.

President Lipp called for an expression of opinion from the meeting on this subject. The consensus of opinion seemed to be in favor of agreeing to standards. Mr. Poehlmann announced that the Wisconsin Association of Master Bakers had the day before gone on record as favoring a standard loaf.

After some further discussion the matter was referred to the executive board with the recommendation that they report through the trade papers.

Your committee is very pleased, indeed, to advise you of the action of the Retail Bakers' Association in indorsing the principle of standard-weight loaves and believes that it will be very helpful indeed to have the indorsement of this association in any attempt to obtain legislation based on the standard-loaf principle.

Respectfully submitted.

(Signed) JOHN M. MOTE, *Chairman*,
JOHN J. CUMMINGS,
F. S. HOLBROOK,
Committee on Bread-Weight Legislation and Tolerances.

NOVEMBER 6, 1922.

Mr. STROBRIDGE. Mr. Chairman, I would like to ask Mr. Holbrook if the model law defines what is a fancy loaf, or fancy bread. That would seem to me to be an important consideration. Sometimes they twist the dough and call the product a fancy loaf; and they may twist it and put a raisin on it and call it a fancy loaf.

Mr. HOLBROOK. Fancy loaves were not exempted by the provisions of the model bill.

Mr. EGAN. I move that the report of the committee be accepted with thanks and the committee discharged.

(The motion was seconded.)

Mr. GOODWIN. It seems to me that this work should be continued, and that the committee which has done such excellent work thus far should be continued.

(The question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS AND TOLERANCES FOR FABRIC-MEASURING DEVICES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN.

The committee on specifications and tolerances was instructed year before last at the Fourteenth Annual Conference to draft specifications and tolerances for fabric-measuring devices. Last year the committee brought in a report upon tolerances, and the tolerances were tentatively adopted. This year to the tolerances which have been tentatively adopted have been added the specifications for these devices. Your committee has to report that these specifications were completed only within the last two or three days. In general, the manufacturers of devices have not had the opportunity of giving them the scrutiny and study which would seem to be indicated, or of making any comments or criticisms in relation to them. It may be noted further that one company has objected in one respect to the tolerances.

Your committee desires to suggest that if the conference adopts these it be done in the same manner as has usually been followed in the past when material has been presented for the first time; that is, tentatively. In this case the opportunity will be given to all the

companies to raise any objections they may have either to the specifications or to the tolerances. The committee will consider such criticisms and report back to the next conference.

These specifications and tolerances have already been distributed to you. There are additional copies here for any who are not already supplied.

DEFINITION.—A fabric-measuring device is a mechanism or machine adapted to measure and automatically indicate the length of fabric passed through it. A computing fabric-measuring device is a fabric-measuring device which automatically indicates the total price of the amount of material measured for a series of unit prices. Unless otherwise specifically indicated by the context, the term "fabric-measuring device" as used herein shall be understood to include computing fabric-measuring devices.

NOTE.—The following specifications shall be applied only to fabric-measuring devices designed and constructed to measure fabrics at retail.

SPECIFICATIONS.—1. Fabric-measuring devices shall be graduated in units of the customary system and its usual subdivisions. The maximum value of the minimum length graduations on fabric-measuring devices shall be one-eighth yard.

NOTE.—This shall not be understood to exclude fabric-measuring devices graduated in the metric system. (See specification No. 12.)

2. The length graduations and the value graduations on all fabric-measuring devices shall be clear and distinct, and their length shall be so varied or they shall be so arranged that their meaning or value is readily apparent and their indications may be conveniently read. The width of any graduation mark shall in no case be less than 0.008 inch.

3. The clear interval between one-eighth-yard graduation marks on fabric-measuring devices shall not be less than eleven-sixteenths inch (0.6875 inch); if inch graduation marks are employed, the clear interval between such inch graduation marks shall not be less than one-eighth inch (0.125 inch). These values shall be applied to the most sensitive indicating element with which the device is equipped. The clear interval between value graduation marks on fabric-measuring devices shall not be less than 0.02 inch.

4. Value charts may be made in accordance with either of the following principles:

(*a*) If the device is so designed and constructed that it purports automatically to compute for a series of unit prices the total price for every length within the range of the device, then the device shall be equipped with a value pointer or indicator and value graduation marks; the value graduation marks shall be correctly placed; and in any position which the indicator or pointer and the chart may assume there will be exposed to view a sufficient number of value figures and graduations to permit the value indications of the device to be read correctly. The value graduations shall not exceed 1 cent at all prices per yard up to and including 30 cents. At any higher price per yard the value graduations shall not exceed 2 cents: *Provided, however,* That nothing in the above shall be construed to prevent the placing of a special value graduation to represent each 5-cent interval. These special graduations may take the form of dots, staggered graduations, or similar forms. They shall be so

placed that their meaning and value may be clearly understood, but they shall not be placed in the space between the regular graduations.

(*b*) If the device is so designed and constructed that it purports automatically to compute only for lengths corresponding to a definite series of length graduations, then there shall be no value graduation marks, and at no position which the chart may assume shall two value figures for the same unit price be completely and clearly exposed to view at the same time. One of the following alternatives shall also be complied with: (1) There shall be a value computation for each length graduation throughout the range of the device; or (2) no value indication may be exposed to view except at such times that the device registers a length indication for which a correct value indication is provided; or (3) each column or row of value graduations shall be clearly and conspicuously marked with the length graduation to which the values correspond, the device shall be marked with the character and limitations of the computations made, and there shall be a computation for at least each one-eighth yard throughout the range of the device. All money values corresponding to definite length graduations must be mathematically correct except as follows: If the mathematically correct amount includes a fractional part of a cent, the fraction shall be dropped if it is less than one-half, but if the fraction is one-half or more the next higher cent may be shown.

5. Each pointer or indicator used in a fabric-measuring device shall be so designed and constructed that a clear, distinct, and accurate reading is given. All pointers or indicators shall be symmetrical about the graduation marks at which they may stand and shall reach to all such graduation marks. The width of the pointer or indicator, or of the end thereof, shall not exceed the width of the smallest graduation marks on the scale with which it is used, and in no case shall such width exceed 0.015. The distance between the pointer or indicator and its scale shall not exceed 0.06 inch.

6. Fabric-measuring devices shall be so designed and constructed that in any position which the indicator or pointer and the chart may assume in its operation there will be exposed to view a sufficient number of figures and graduations readily to permit the length indications of the device to be read correctly.

7. Fabric-measuring devices shall be so designed and constructed that the indicating elements used in registering length or prices of deliveries to individual purchasers are returnable readily to a definite and clear zero reading before the next measuring operation is begun.

8. All fabric-measuring devices shall be correct in their length and value indications, whether the indications are being increased or decreased.

9. If a fabric-measuring device will not give correct results when used for the measurement of all fabrics, then the device shall be so marked as clearly to indicate its limitations.

10. All markings, instructions, figures, and graduations required under these specifications shall be of such size, design, material, and location and shall be so applied or affixed that they will not tend easily to become obliterated or illegible.

11. All fabric-measuring devices and all devices designed to be attached thereto and used in connection therewith shall be of such

construction that they are not designed to and may not be used to faciliate the perpetration of fraud.

12. Nothing contained in the above specifications shall be understood or construed to prohibit the sale or use of fabric-measuring devices constructed or graduated in units of the metric system.

The tolerances to be allowed on fabric-measuring devices constructed or graduated in units of the metric system shall be the same as those specified on similar devices of an equivalent size in the customary system.

TOLERANCES.—The tolerances to be allowed on the delivery of retail fabric-measuring devices in excess (under registration of device) and in deficiency (over registration of device) to be applied on both increasing and decreasing registrations of the machine shall be the values shown in the following table: Provided, however, That the manufacturers' tolerances or the tolerances on all new retail fabric-measuring devices shall be one-half of the values given:

Machine indication.	Tolerances on delivery of retail fabric-measuring device.[1]	
	In deficiency (overregistration).	In excess (underregistration).
Yards.	*Inch.*	*Inch.*
1	1/4	1/4
2	1/4	3/8
3	5/16	3/8
4	5/16	1/2
5	3/8	5/8
6	7/16	3/4
7	1/2	1
8	1/2	1
9	9/16	1 1/4
10	5/8	1 1/2
11	11/16	1 1/2
12	3/4	1 3/4
13	7/8	1 3/4
14	1	2
15	1	2

[1] "Tolerances on delivery" refers to the variations between the indications of the fabric-measuring device and the corresponding actual lengths of testing strip passed through the device and does not apply to check measurements made upon lengths of fabrics which have been commercially measured.

For machine indications of more than 15 yards add one-sixteenth inch in deficiency and one-eighth inch in excess per indicated yard.

Respectfully submitted.

(Signed) F. S. HOLBROOK, *Chairman.*
WM. F. CLUETT,
R. F. BARRON,
C. M. FULLER,
Committee on Specifications and Tolerances.

DISCUSSION OF ABOVE REPORT.

Mr. HOLBROOK. Supplementing the report of the committee, I wish to add a brief comment on certain paragraphs of the proposed code.

The note to specification No. 1 is incorporated merely to recognize measuring machines based on the metric system, calling attention to the fact that sales in the metric system shall not be held illegal. The specification is along the same lines as that already adopted for linear measures.

In reference to specification No. 3, the necessity for the requirement that there shall be a certain clear interval between graduation marks is that there be obtained sufficient sensitiveness in the machine so that errors in setting which will be unavoidably made by the sales person will not result in errors greater than the proper tolerances.

Now, in relation to the two general principles set forth in subdivisions (*a*) and (*b*) of specification No. 4, I might say that (*a*) refers to a chart which up to this time, in so far as we know, has never been used on a fabric-measuring machine. It is the principle of the ordinary chart which is used in the case of computing scales, and there is no reason why it should not be allowed in the case of these fabric-measuring devices by anyone desiring to do so.

The principle embodied in (*b*) is that of the devices to which we are accustomed, namely, those devices which purport only to indicate the prices for a certain series of unit graduations. For instance, we are all accustomed to those machines in which the computations are made for one-eighth yard units. The requirements specified in (*b*) seem to be all that are necessary when the value indications are going to correspond to exact lengths.

In the case of some devices now on the market it may be said that in advertising matter they are specifically not recommended for materials with certain characteristics. It is intended under specification No. 9 that such a warning should be put on the machine itself, specifying its limitations. It may not, perhaps, be necessary to detail the names of the fabrics which are not correctly measured by the machine, but the statement may specify these materials in a general way according to their characteristics.

Mr. McGrady. I move you that the report read by Mr. Holbrook be adopted tentatively by this conference.

The Chairman. It has been moved and seconded that the report of the committee on specifications and tolerances relating to fabric-measuring devices be adopted tentatively.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(It was moved and seconded at this point that the conference adjourn; the question was taken, and the motion was agreed to.)

(Thereupon, at 4.30 o'clock p. m., the conference adjourned to meet at 10 o'clock a. m. Thursday, May 24, 1923.)

SEVENTH SESSION (MORNING OF THURSDAY, MAY 24, 1923).

The conference reassembled at 10 o'clock a. m. at the Bureau of Standards, William B. McGrady, second vice president, presiding.

ORIGIN AND DESTINATION WEIGHING OF COAL IN CARLOAD LOTS.

By E. Kent Lawrence, *General Scale Inspector, Baltimore & Ohio Railroad.*

Mr. Chairman, gentlemen: The subject of coal weighing should be, I feel, of importance to all, as the weight is the basis on which all settlement is made from the wage paid to the man who mines the coal to the price paid by the consumer at its final destination down to the purchaser in bushel lots.

This paper is confined to a general description of the railroad weight, or origin weight, the means and methods of obtaining this weight, and the variations from this weight at destination, with some of the causes for these variations.

Coal in carload lots is weighed by the railroad, and these weights are used by the railroad for the assessment of freight charges; also, practically all coal shippers state specifically in their contracts with consignees that settlements will be made on the railroad weight. This being the case, it is of the utmost importance that these weights receive most careful attention.

In order to facilitate the movement of the large tonnage of coal and to secure the best and most satisfactory results, it has been found expedient to concentrate the weighing and waybilling at special coal-weighing stations, where the yards are laid out to meet the requirements. There is a receiving yard connected to the outbound or classification yard by a main lead over a hump, the scale being located on the hump, so that cars can be weighed in motion. The volume of business is so great that the delay which would be caused by the spotting of each car for weighing would be prohibitive. The hump is so designed that the cars will obtain sufficient momentum to carry them to the far end of the longest classification track, and the scale is so located with reference to the apex of the hump that the car will not exceed a speed of 4 miles per hour over the scale, and the entire car will be on the scale approximately three seconds. This speed over the scale and the elapsed period on the scale are obtained without the use of the brake. These figures relative to speed of car and particularly the time the car is on the scale have been found, by test, to give us the best results with the automatic weighing attachment.

The scales at all of the coal-weighing stations are of modern design, heavy type, installed on foundations designed to take care of the heaviest cars and the passage of locomotives over the dead-rail system without any giving under the load. Let me say at this point that the question of adequate foundation is of the utmost importance in the installation of all classes of scales. The scales are equipped with automatic weighing devices which stamp the weight of the car

on a card. This weight is on the original shipping order which is made out for and travels with each car from the mine to the coal-weighing station. This shipping order made out by the shipper is known as the scale card waybill and gives full billing instructions, including the car number, shipper's name, point of loading, consignee, destination, and grade of coal. The automatic machine has been improved in design from time to time and is at present surrounded with all safeguards to assure its proper operation. A locking device in connection with the scale rail locks the machine if the wheels of the car following the car being weighed should get on the scale before the weight of the first car is stamped, resulting in no weight being shown for the car, which must then be brought back to obtain its weight.

The scales on account of their importance and the number of cars weighed (they will average at our larger stations 800 to 1,000 cars of coal daily in addition to other carload commodities) receive special attention as regards maintenance and test. Our rule governing the test of scales reads as follows: "A daily test will be made on each scale equipped with automatic attachment by weighing a car spotted on the trip end with beam, also in motion with automatic attachment." This is in addition to the regular tests made with the scale-test car, and is primarily to assure the weighmaster that his attachment and his beam are together; he assumes his beam weight is the correct weight. To show that this assumption is well founded and that the scale does not vary to any great extent between regular scale car tests, I would advise that we have had this class of scale in service for periods of from three to five years without finding them varying more than 0.10 per cent of the test load, the tolerance according to the Bureau of Standards, being, as you know, 0.20 per cent. If the attachment shows a variation greater than 100 pounds either side of the beam weight, adjustment is made, and in those cases in which there is a radical difference and inspection does not develop a cause that the weighmaster can remedy the scale inspector is wired for at once.

A comparative test was made of the beam against the automatic weight by weighing 68 cars in motion with the attachment and spotted with the beam. The total difference between the automatic weight and beam weight was 2,500 pounds, an average of 37 pounds per car, amounting to about a fair sensibility reciprocal for a track scale. The greatest individual errors were one of 400 pounds and one of 260 pounds; all others were 200 pounds or less, these variations being light and heavy. The cars in the test varied in weight from 80,000 pounds to 155,000 pounds.

The stamped weight on the original shipping order card is a permanent record filed away at the coal weighing station, the revenue waybill being made out at this point and accompanying the car to destination. The car goes through to destination in the usual transit time according to the distance hauled. When it reaches the local dealer or retailer, he weighs the coal for the most part on wagon scales in 1, 2, or 5 ton lots—I doubt if there are very many in the last-mentioned amount—and it is from these consignees, no doubt, that you gentlemen have complaints as regards shortages.

Let me state here, gentlemen, that we do not claim infallibility for railroad scales and the results obtained from them, for there is no such thing as 100 per cent scales or 100 per cent efficiency in the operation of the scales or in their operators. We do claim that our scales are, to the best of our ability, designed, installed, maintained, and operated to give you as near correct weights as we can, and our forces operating the scales and billing the coal are well organized and their work checked frequently.

To get back to the consignee and his weight, it has been my experience up to very recent years that the ordinary wagon scale as installed was good; its maintenance, however, was poor and in many cases absolutely negative; tests were unheard of or worthless. To-day the scale installations are not only good but very good, and the maintenance and tests of the scales are vastly improving, thanks in great part to the campaign of education for care of scales, for which you gentlemen are largely responsible.

If a shortage is now reported to you, you satisfy yourself that the scale is in proper condition, free and clean and reasonably maintained. If possible, you have a test of the scale made. Let us assume you find all these conditions satisfactory. In addition, let us assume that a shortage is found, for instance, 2,000 pounds on a 100,000-pound load, and the railroad declines to issue corrected waybill. Why?

The published tariff of the railroad, I. C. C. 2205, provides a tolerance (the difference in weight due to variation in scales or weighing which may be permitted without correction of the waybill) of 1 per cent, plus one-half of 1 per cent for variations due to the evaporation of moisture. The scale variation in the tariff is assumed to be between two track scale weights, whereas in the case assumed the weight was taken in a number of drafts on a wagon scale. The coal has been handled from car to wagon with some loss, any error in the wagon scale has been muliplied by the number of drafts, and the weight of each load taken to the nearest 10 pounds, all of which factors must be taken into consideration and could readily account for the difference of 350 pounds between the tolerance allowance of 1.5 per cent of the lading, 1,650 pounds, and the 2,000 pounds shortage found.

There is one other variation that I have not as yet touched upon which is of considerable importance, and that is the variation due to weather conditions. Coal is transported almost exclusively in open cars and is subjected to the direct action of the elements, particularly rain, snow, and sleet. This is a risk that is understood and should be taken into consideration by all interested in the handling of coal. A car of coal will take up during a rainstorm the full amount of precipitation for an area equal to the exposed top of the car. The present-day coal cars present an exposed top area of 40 by 9½ feet, or 380 square feet, and for each 1 inch of rainfall on this car the weight will be increased approximately 2,000 pounds. This added weight will be lost under ordinary fair weather conditions in from two to three days. This was shown by a test made with 14 cars of coal, which were weighed, run under a penstock, water added to cars, and then reweighed. The average increase in weight due to this added water was approximately 700 pounds, equivalent in amount to about 0.3 inch of rainfall. Two more weights were taken 24 and 48 hours

later. The first weight after a lapse of 24 hours showed an average loss of 400 pounds per car and the second after 48 hours an average loss of 550 pounds per car. The cars had lost all but 150 pounds per car of the 700 pounds of water added. It will thus be readily seen that in the event that a car is weighed during or shortly after being exposed to a rainfall and then reweighed several days later, after a period of clear weather, there will be a variation other than the regular tolerance variations that will enter into the question. In the same way the increased weight during the winter weather due to snow and sleet falling on the car before weighing must be considered. However, quite frequently a quantity of this remains with the lading to destination, the melting snow being absorbed by the coal and freezing, in which case deficiencies in weight due to this cause do not occur.

A number of comparative studies have been made of the billed railroad weight as against the outturned destination weight. The Baltimore & Ohio made a check of a year's business at one of its ports, amounting to nearly 1,700,000 tons, and found a variation amounting to 0.027 per cent. There was a gain in weight at destination during the months from October to March, inclusive, and a loss during the other months of the year. It is our opinion that these variations are due in great measure to weather conditions and their effect on moisture contents, conditions in the spring and summer being conducive to loss and in the fall and winter to the retention of moisture.

The Government here in Washington made a check, at its fuel yard and at St. Elizabeths Hospital, on 100 cars of coal, and their weights differed from the railroad billed weight by only 800 pounds on a total of 11,500,000 pounds, a difference of less than 0.007 per cent.

I have attempted to give you a general outline of the manner in which coal is weighed by the railroads, how we attempt to safeguard this weight, the variations that are bound to exist between this and destination weight, and some of the causes therefor. These remarks cover general conditions which should be considered in the investigation of each individual case of complaint. Gentlemen, I thank you.

DISCUSSION OF ABOVE PAPER.

The Acting Chairman. You have heard Mr. Lawrence's paper. I fully coincide with that portion in which he said there is not so much difference in the wagon scales now as was formerly the case. They are in much better condition now than when I became connected with the work years ago. Errors were largely due to the faulty condition in which the wagon scales were maintained. Conditions to-day in Pennsylvania are entirely different. The wagon scales are in much better condition.

Mr. Roberts. In regard to moisture in coal, I had occasion to make some tests not long ago. The difference in weight between wet and dry coal was under consideration. We made a test of it and we found weight variations between dry and wet coal of from 1 to 8 pounds per cubic foot. In one instance, in one coal dealer's yard, we took the weight of run-of-mine coal, which absorbs more moisture than any other grade of coal, on samples taken from the top of the pile and the bottom of the pile two days after a rain. We found there was 8 pounds difference. I would like to know if there is any

city represented here which has any laws requiring the retail dealer to keep the coal under sheds. That question has been raised, and I have been unable to find if any State has a law which requires coal to be kept under cover, so that the consumer can buy dry instead of wet coal.

The ACTING CHAIRMAN. Can any of you gentlemen answer the question?

Mr. ROBERTS. It seems that the consumer must take advantage of seasonal conditions and buy his coal in dry weather.

RETAIL SALE OF COAL AND COKE.

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets, District of Columbia.*

In forming an opinion on the subject of the best method of selling any commodity convenience as well as accuracy should be given much consideration. Coal is no exception to this rule. We are often inclined to drift too far into the whirlpool of technicalities in dealing with subjects of great importance to the general public, when it is our duty to work out plans which may be easily understood by all and easily applied in ordinary business transactions.

The person with a well-trained mind drives in that direction, whereas the person with an untrained mind, through operation of his imagination, is led to look after the difficult and intricate. This is very well illustrated by the fact that the child in seeking to solve problems in arithmetic which may be simple looks for a difficult method of procedure, because he imagines the problems must be difficult otherwise they would not be in the book. Another class embraces those who fall into certain habits, and no matter how productive of business inefficiency such habits may be refuse to shake them off.

The up-to-date merchant, regardless of the particular line in which he may be engaged, endeavors so to systematize his business that he is able to carry it on with convenience and accurately arrive at the profit he makes or the loss he sustains. However, we find certain classes of business which are generally conducted in a slipshod manner and on an indefinite and uncertain basis. Several which fall readily into this class might be mentioned. The coal business is one of them. This may not be true of every locality, but it is of many. I consider it unfortunate that penal laws must be invoked in some instances not only for the purpose of protecting the purchaser against fraud, but for the purpose as well of protecting the merchant against the results of his own folly.

Prior to 1921 there was no law in the District of Columbia requiring the sale of coal by weight. The custom was to buy and sell large quantities by weight but to buy and sell small quantities by measure; that is, by the bushel. Many hundreds of families among the poorer classes purchased in no other way. Some dealers with established places of business had a large "bushel trade," and practically all the hucksters sold in that manner. The bushel custom was deep rooted and firmly established. It was productive of fraud, deception, uncertainly, and dispute. The actual quantity delivered for a bushel depended much, of course, upon the kind of coal, the method of measuring, and whether or not the measure was heaped.

The situation was deplorable, and when Congress passed the new weights and measures law for the District a provision was inserted prohibiting the sale of coal in any other manner than by weight.

After prescribing that the usual ticket stating tare, net weight, etc., shall accompany the load and be delivered to the purchaser or his agent when delivery is made in a vehicle, the law provides that in sales of 280 pounds (one-eight ton) or less, when not weighed in a vehicle, it shall only be necessary to deliver a ticket indicating the net weight of the coal. The law further provides that when coal is sold in packages of 50 pounds or less it shall be sufficient to mark conspicuously on the package the net weight and the name and address of the packer thereof. The purpose is to facilitate delivery of definite quantities in order that the vendor may conduct his business without inconvenience and at the same time know the quantity he delivers and the purchaser may know the quantity he receives. Every reasonable means for bringing about this desirable end has been provided.

Now, I am of the opinion that established trade customs should not be disturbed by legislation unless it can be affirmatively shown that such customs facilitate or result in the perpetration of fraud. The habits and customs of the people should be molded into law except where such habits and customs produce or tend to produce injury to others. The practice of buying and selling coal or other commodities by the bushel, in my opinion, falls with the latter designation.

After the law became operative our department used every means at its command to inform dealers, hucksters, and the public of its provisions and to assist them in every reasonable way to observe it. Notwithstanding these facts, much difficulty in its enforcement has been encountered, and I am convinced that thorough enforcement can be brought about only through a long process of education and a considerable number of prosecutions. It has been as difficult to bring dealers with established places of business—men of apparent intelligence—to an understanding and observance of the law as it has been to arrive at the same result with hucksters. Many particular instances and many definite facts could be adduced to forcibly demonstrate the accuracy of the foregoing statements, but if I should cite them I might be charged with dealing in disagreeable personalities, and this I wish to avoid. I may say, however, that of a series of purchases made by employees of the weights and measures department of the District of Columbia last winter of coal being sold by the bushel in violation of the law the weights of the alleged bushels purchased ranged from 52 pounds to 80 pounds. I think it unnecessary to state what action was taken by our department in cases of that kind.

The facts clearly demonstrate, however, the wisdom of making sales of coal by weight and the benefits to be derived not only by the public but by vendors as well. Our experience further demonstrates that it is extremely difficult to change deep-rooted and established trade customs by law, and that such should be done only in instances where the change is in furtherance of the public interest. I believe that the benefits in this instance fully warrant the action taken, and we hope before a great while to bring about a rigid observance of the law.

DISCUSSION OF ABOVE PAPER.

The ACTING CHAIRMAN. In connection with Mr. Roberts's paper, Pennsylvania has a law that the weight of coal sold by the bushel must be 76 pounds. It is a very hard proposition to control the local dealer and the huckster and require them to sell by the bushel weight. They fill the measure up; it may be 70 pounds, but sometimes it is 65 pounds.

Mr. ROBERTS. I would like to ask if you do not think it would be better if you merely had a provision saying that it should be sold by weight. Don't you think that the provision saying that a bushel shall be a certain number of pounds is more or less confusing? Sometimes this number of pounds may not fill a bushel measure and the buyer then thinks he is cheated.

The ACTING CHAIRMAN. There is no question but that everybody connected with weights and measures is heartily in favor of selling by weight only, but you will have a hard time to force the hucksters to sell by weight.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON A SUBSTITUTE FOR SPECIFICATION NO. 23-A FOR SCALES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN.

The committee on specifications and tolerances desires to present a new specification in reference to scales which is offered as a substitute for specification No. 23—a under the heading "Scales—General specifications." We think it important that this be considered at this time when tolerances for automatic scales are about to be discussed.

Under the heading "Scales—General specifications" we now have specification No. 23–a reading:

> All scales shall give correct weight indications whether the load is being increased or decreased.

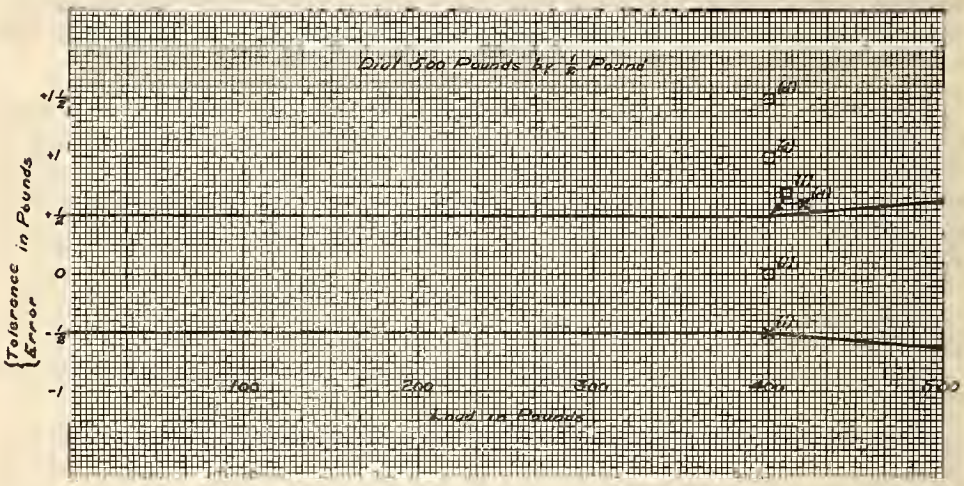
This specification is to the effect that when weights are being successively added to the platform of a scale all errors developed on this increasing load test shall be within the tolerances given in the table. As the weights are being successively removed from the platform of the scale and the pointer is reversing its direction, then all errors on the decreasing load test shall be within the same tolerances.

Now, for example, take the case of a scale of 500 pounds capacity and suppose that the tolerance at the 400-pound point is plus or minus one-half pound. If the scale is slow one-half pound on the increasing load test, it is within the tolerance. If the scale is fast by one-half pound on the decreasing load test, it is also within the tolerance. These errors being in opposite directions the range between them is 1 pound, and a scale will pass at the 400-pound point if those are the errors found. That difference in indication mentioned is the maximum allowable; that is, the sum of the plus and minus tolerance at any point on the scale is the total maximum range of error which may be allowed to occur. We will indicate these errors mentioned by two crosses on the diagram, the one marked (*i*) being the error at the increasing load and the one marked (*d*) being the error at decreasing load.

FIG 2.—*Diagram illustrating application of specification No. 23–a for scales.*

Now, consider a scale which has no readable error on the increasing load test, but which is otherwise in the same condition as this scale just mentioned. Then it will necessarily have the same range of error at the 400-pound point; that is, it will necessarily be in error by 1 pound fast on the decreasing load test. We will indicate these errors by circles on our diagram, the one marked (*i*) again being the error on the increasing load test and that marked (*d*) being the error on the decreasing load test. The first-mentioned scale will meet the present specification, while this latter scale will fail to meet the present specification. However, the latter scale is the better scale unquestionably.

Under this condition of affairs a manufacturer, or a field service man, upon testing a scale and finding the decreasing load error at any point outside of the tolerance will always be tempted to adjust his scale to read slow going up in order to have a better opportunity of coming within the tolerance on the decreasing load test. Inas-



much as it is the general experience with automatic scales that a change resulting from use will usually be in the "slow" direction, and inasmuch as the manufacturer or the field service man is tempted to make his scale "slow" upon adjustment, we have a case where the scale left "slow" upon adjustment will very quickly go outside of the tolerance on account of use. This is a very unfortunate state of affairs, since it tends to militate against continued accuracy.

Now, the committee has been working on a plan to correct this condition and desires to present a specification whereby the second scale mentioned above may be passed without increasing the present maximum range of error; that is, we desire to leave the maximum range between errors the same but at the same time allow the manufacturers to make the scale just as nearly correct as possible upon the increasing load test.

The specification which has been worked out and which is being presented to you as a substitute for the present specification No. 23–a reads as follows:

When tests are being made with both increasing and decreasing loads on any scale, at any stage of the test the range between corresponding observations for increasing and decreasing loads shall not be greater than the sum of the tolerances in excess and in deficiency for the load in question. [6]

We have shown that, when a plus or minus error of one-half pound is allowed at the 400-pound point on a scale, under the present specification a scale indicating 399.5 pounds with an increasing load of 400 pounds and indicating 400.5 pounds with the same decreasing load will comply with the specification. The range between these two indications is 1 pound.

We now desire to allow this scale to be adjusted to read exactly 400 pounds with an increasing load and accept it if it has the same range as before; that is, if it indicates 401 pounds on the decreasing load test. The specification as now presented accomplishes this.

It may also be mentioned that, since this specification makes no changes in the tolerances to be allowed on an increasing load test, under the proposed specification the scale is also to be accepted if it indicates 400.5 pounds on the increasing load test and 401.5 pounds on the decreasing load test. For the sake of completeness these errors are also included in our diagram, being represented by squares, (*i*) and (*d*) again denoting indications at increasing and decreasing loads, respectively. Of course, this represents the most extreme case which can arise under the specification and is not a recommended adjustment of the scale.

The indications at increasing loads on the scale are very much more important than the decreasing loads, since this is the way in which the scale is normally used. However, the range between errors or indications on the increasing and decreasing loads should be regulated to some extent, because investigation has demonstrated that the smaller the area embraced by the curves representing indications at increasing and decreasing loads the better the scale; in other words, this area is an indication of the workmanship of the scale. If the scale is very deficient in workmanship, you will find greater differences between the errors at increasing and decreasing loads than would otherwise be the case, these differences being to some extent a measure of the backlash and friction in the parts. But we do not want a specification to stand upon our books which will result in the accuracy of the increasing load indications being sacrificed for the sake of making the decreasing load indications more nearly correct for the reason heretofore stated, that the increasing indications are intrinsically much more important than the decreasing indications.

In these illustrations we have assumed a definite weight to show what is meant. Of course, the specification applies to all the indications of the scale.

We desire to repeat that this does not involve an increase in the maximum range between the allowable errors. Under both of these specifications the maximum range is exactly the same. Moreover, it should be emphasized that the tolerances on increasing load indications are not affected or changed in any way whatever.

[6] In order to make this specification more readily understandable, a slight modification in wording, which does not alter the meaning in any way, has been made since this specification was first presented to the conference.

The committee desires to recommend that this modified specification be adopted in lieu of present specification No. 23–a, under the heading "Scales—General specifications," for the reasons given.

If this suggestion is adopted, then specifications identical in substance with this, occurring under two subheadings—namely, "spring scales" and "computing scales"—should be modified to the same effect.

(Signed) F. S. Holbrook, *Chairman*,
Wm. F. Cluett,
R. F. Barron,
Chas. M. Fuller,
Committee on Specifications and Tolerances.

(It was moved and seconded that the specification as amended be adopted, the question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON TOLERANCES FOR HEAVY-DUTY AUTOMATIC SCALES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN.

The committee on specifications and tolerances presented to the Fifteenth Annual Conference a report on tolerances for heavy-duty automatic scales, which was accepted by the conference and laid upon the table in order to give the officials an opportunity to see how the suggested tolerances would work out in practice.

In that document was included a statement of the condition of a large number of automatic scales in service which had been tested jointly by the Bureau of Standards and by the committee on specifications and tolerances.

A résumé was given of the various recommendations which had been made in relation to tolerances by interested parties, and finally the committee gave as its conclusion that beam-scale tolerances should be the basis for tolerances on automatic scales, certain necessary modifications being made in order to make the tolerances applicable to automatic scales. In deciding upon this basis we cited the fact that the majority of the manufacturers of automatic scales had expressed themselves as in favor of that basis, although some manufacturers were inclined to think that the tolerances suggested were somewhat too small.

We can report this year that the majority of manufacturers of automatic scales again declare that the tolerances as proposed last year are satisfactory to them. No very definite objections were made by other manufacturers, although it is believed that some of them still believe that the proposed tolerances are slightly too small. When tolerances were suggested last year, it was recommended by the committee that they be adopted tentatively only on the ground that some important users of automatic scales had requested that they be given an opportunity to study the tolerances and make such recommendations as seemed wise to them. The committee explained that in justice to those large users it was considered that the report should not be finally adopted at that time.

During the year the users to whom I refer have had the opportunity of studying the recommendations; but as yet, although solicited, your committee has not heard from them in relation to recommendations. Consequently, the committee is now inclined to resubmit

the report made last year and the tolerances contained therein for the final action of the annual conference. It is suggested in that connection that the tolerances be enforced in line with recommendations of the committee, made in last year's report, that special consideration should be given in many cases to automatic scales already in use. In so far as scales hereafter to be put into use are concerned, it seems to your committee that the tolerances may be strictly applied.

The specific portions of last year's report which are of especial interest in this connection may be quoted as follows:

* * * as to scales hereafter to be produced by the manufacturers and put into commercial service, the committee is placing before you for your consideration a system of tolerances having as a basis the tolerances now allowed on beam scales.

As to scales already in use somewhat different considerations govern.

While in theory there seems to be no definite reason why such scales should not be governed by the same tolerances as are to be presented, nevertheless as a matter of practical expediency and justice it may be found necessary or advisable to allow somewhat more liberal tolerances in the field. These scales have been bought and used in good faith; they represent a considerable investment of capital; they have heretofore been allowed in use with the consent of the official and will often be found to bear his seal, although certainly not a majority of them will comply with the tolerances to be presented.

Your committee has given attention to this phase of the situation in an endeavor to decide whether separate tolerances could be presented for these scales, such as twice the tolerances to be suggested for scales hereafter to be put into use, but has decided against this step, since often the conditions of the individual case must govern the decision.

In relation to scales already in use it would be our recommendation that great care be exercised in putting them into effect and that, if after a careful survey of his district it appears to any official that great and unnecessary hardship would be the result of enforcement in general or in particular cases, he use his best judgment as to whether or not they are immediately to be put into force or as to the best manner of putting them into force.

One other point should also be mentioned. Last year the report contained the following:

DEFINITION.—A heavy-duty automatic indicating scale is a scale of a total capacity of 500 pounds or more in which is embodied or to which is attached a self-acting mechanism, the capacity of which may be equal to or less than the total capacity of the scale, through the agency of which the indicated or recorded weights of variable loads may be obtained. This classification does not include scales which automatically weigh out commodities in predetermined drafts, such as automatic grain-hopper scales, packaging scales, etc.

A motion was adopted at the last conference to the effect that the committee should give consideration to all automatic scales not of the counter type and embrace these within the tolerances to be recommended for adoption, rather than to limit its recommendations to scales of a capacity of 500 pounds or more.

There are many such scales now in use and now being manufactured. The committee has given that matter consideration and reports that it is of the opinion that the present tolerances recommended will be entirely applicable to heavy-duty scales of less than 500 pounds capacity.

Therefore, a change should be made in the definition in order that such scales may be included. We suggest that the definition be amended to read as follows:

DEFINITION.—A heavy-duty automatic indicating scale is a scale, other than of the counter-scale type, in which is embodied or to which is attached a self-acting mechanism, the capacity of which may be equal to or less than the total capacity of the scale, through the agency of which the indicated or recorded weights of variable loads may be obtained. This classification does not include scales which automati-

cally weigh out commodities in predetermined drafts, such as automatic grain hopper scales, packaging scales, etc.

Automatic scales of the counter type are already covered by our counter-scale specifications and tolerances and this definition will take up the line of self-indicating scales at the point where the definition of counter scales no longer applies. It may be that some slight modification of definition may still be necessary, but this seems to include all automatic scales which are not of the counter-scale type and which are of a reasonably heavy type, which it is thought should be included at this time.

The tolerances proposed will now read as follows:

NONRETROACTIVE TOLERANCES FOR HEAVY-DUTY AUTOMATIC INDICATING SCALES.

DEFINITION.—A heavy-duty automatic indicating scale is a scale, other than the counter-scale type, in which is embodied or to which is attached a self-acting mechanism, the capacity of which may be equal to or less than the total capacity of the scale, through the agency of which the indicated or recorded weights of variable loads may be obtained. This classification does not include scales which automatically weigh out commodities in predetermined drafts, such as automatic grain hopper scales, packaging scales, etc.

NOTE.—The tolerances herein presented for consideration are, as is stated above, not intended to be applied strictly to scales already in use.

These tolerances are not to be construed as applying to railroad track scales, whether or not automatic indicating devices are embodied in or attached to such scales.

TOLERANCES.—The tolerances to be allowed in excess or deficiency on heavy-duty automatic indicating scales shall be the values shown in the following table: Provided, however, That the tolerances on the dial or reading face on all these automatic indicating scales shall in no case be less than the value of one of the minimum graduations on the dial or reading face, or one five-hundredth of the capacity of the dial or reading face, whichever is less, except that on such of these scales as have a minimum graduation of 1 pound or more on the dial or reading face such tolerance shall not be less than 1 pound. The tolerances on any beam or beams with which the scale may be equipped shall be the same as those specified above, except in cases where the value of the minimum graduatian on any such beam is less than that of the minimum graduation on the dial or reading face, or one five-hundredth of the capacity thereof, whichever determines the minimum tolerance on the dial or reading face, in which cases the minimum tolerance on any such beam shall be the minimum graduation on any beam with which the scale may be equipped.

The minimum tolerance to be allowed on the ratio or the multiplying power of the scale shall be the same as the minimum tolerance allowed on the beam: And provided further, That the manufacturers' tolerances or the tolerances on all new heavy-duty automatic indicating scales shall be one-half of the values specified above.

The tolerances to be allowed on heavy-duty automatic indicating scales used exclusively in determining weights for the sole purpose of fixing charges for the transportation of freight shall be twice those specified above.

Load in pounds.	Tolerance, class A.		Tolerance, class B.	
	On ratio.	On dial or beam.	On ratio.	On dial or beam.
	Ounces.	*Ounces.*	*Ounces.*	*Pounds.*
50	½	1	.....	.....
100	1	2	.....	.....
200	2	4	.....	.....
300	3	6	.....	.....
400	4	8	.....	.....
500	5	10	10	1¼
600	6	12	12	1½
		Pounds.	*Pounds.*	
800	8	1	1	2
1,000	8	1	1	2
1,200	10	1¼	1¼	2½
1,500	12	1½	1½	3
1,800	14	1¾	1¾	3½
	Pounds.			
2,000	1	2	2	4
2,500	1¼	2½	2½	5
4,000	2	4	4	8
6,000	3	6	6	12
8,000	4	8	8	16
10,000	5	10	10	20
12,000	6	12	12	24
16,000	8	16	16	32
20,000	10	20	20	40
24,000	12	24	24	48
30,000	15	30	30	60
40,000	20	40	40	80
50,000	25	50	50	100

NOTE.—The values given in the above table are the same as those adopted by the Eleventh Annual Conference for platform scales of the beam type and incorporated in Bureau of Standards Circular No. 61 and Handbook No. 1.

EXPLANATION OF PRECEDING TABLE.—Class A scales include the following: Scales of the portable platform type; and also scales of the self-contained or dormant and built-in types which are installed inside of a building having side walls and roof, which protect the scale from weather effects and from sudden changes of temperature.

Class B scales include the following: Scales of the motor-truck and wagon types; and also scales of the self-contained or dormant and built-in types which are not installed inside of a building having side walls and roof and which are exposed to weather effects and sudden changes of temperature.

NOTE.—The latter effect, since it causes the condensation of moisture on the scale parts, often has as serious results on the condition of the scale as have weather effects.

The values in the columns with the headings "Tolerance," "On ratio" are to be applied to the ratio or multiplying power of such scales with which loose counterpoise or "bottle" weights are used; namely, those which are manually applied and removed and are not an integral part of the scale mechanism.

The values in the columns with the headings "Tolerance," "On dial or beam" are to be applied to those parts of such scales not requiring the use of loose weights; for example, the dial, a beam, or "built-in" automatic or semiautomatic counterpoise or unit weights; namely, those which are automatically or mechanically added and are an integral part of the scale mechanism and not designed to be detached therefrom.

TOLERANCES ON WEIGHTS.—The tolerances to be allowed on loose counterpoise or "bottle" weights used on heavy-duty automatic indicating scales shall be the same as those specified for such weights used on beam scales.

(Signed) F. S. HOLBROOK, *Chairman.*
WM. F. CLUETT,
R. F. BARRON,
CHAS. M. FULLER,
Committee on Specifications and Tolerances.

(A motion was made and seconded that the report be finally adopted; the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. Mr. Chairman, before I lose my place, what shall be done with the specifications and tolerances for vehicle tanks?

(At this point H. A. Webster, first vice president, assumed the chair.)

Mr. FULLER. Mr. Chairman, I move you that we continue the work we started yesterday on specifications and tolerances for vehicle tanks.

Mr. PAUL. Mr. Chairman, yesterday we were very anxious to go on with the discussion of specifications and tolerances for vehicle tanks, but the consensus of opinion of the conference was that we should follow the program. Now, since there are a good many here interested in resolutions, let us continue with the report of the committee on resolutions and then we can take up the tank proposition.

Mr. FULLER. Mr. Chairman, I know that the representative of the tank people has been here for several days looking for it to come up on the program, and he has to leave for New York, and that is the reason why I thought we should take it up at the earliest opportunity.

The ACTING CHAIRMAN. The chair will state that it will not take long to go through with the resolutions.

(A motion was made and seconded that vehicle tanks be considered at a later point on the program. The question was taken and the motion agreed to.)

RESOLUTION ON THE LIFE AND WORK OF SAMUEL WESLEY STRATTON, PRESENTED BY JOSEPH J. HOLWELL, CHAIRMAN OF SPECIAL COMMITTEE.

Whereas the calling of Samuel Wesley Stratton, on January 1, 1923, from the directorship of the National Bureau of Standards to the presidency of the Massachusetts Institute of Technology is both a recognition of and a fitting tribute to one who has rendered invaluable service to commerce and industry in America and has served his country well in her hour of need, and his acceptance of the proffered presidency means much for the continued future usefulness of that famous institute of learning, for he brings to it a ripe experience and an exceptional ability to direct its manifold activities; and

Whereas Samuel Wesley Stratton feels that this change in his vocation makes it necessary for him to resign from the office of president of the Annual Conference on the Weights and Measures of the United States, a position which he has so long and so honorably held, it is considered that this time is an appropriate one briefly to review his life history and achievements, and with this thought in mind the following is presented:

Samuel Wesley Stratton, like many other celebrated Americans who have contributed to their country's greatness, was born in humble circumstances. His parents were God-loving people of the hardy pioneer stock, who helped to develop the settlement of Litchfield, Ill., where he was born July 18, 1861. Modest though their circumstances, great was their desire that their son should have the advantage of an early education, and by dint of their efforts this was provided by them. Although

lacking most advantages enjoyed by the American youth of to-day, young Stratton after completing his school work was determined to secure a higher education. He entered the University of Illinois, and by engaging in work after his college hours was able to pay his way through college. At the age of 23 the University of Illinois conferred upon him the degree of Bachelor of Science in Mechanical Engineering.

In recognition of his exceptional ability the University of Illinois called him in 1885 as an instructor of mathematics and physics, promoted him in 1889 to assistant professor of physics, and advanced him in the same year to the chair of physics and electrical engineering, which honored position he held until 1892. The same year he was called by the University of Chicago to be assistant professor of physics, was promoted in 1895 to an associate professorship, and in 1898 was made a full professor.

Appreciating in his collegiate days that America in case of war would require the services of those of her sons who by education were prepared to officer her Army and Navy, young Stratton took a military course at the University of Illinois and graduated with the rank of captain. Desiring to supplement his military education and to be ready to perform some useful service should his country call, in 1895 he entered the Illinois Naval Militia and served with distinction until 1901, first as ensign, then as lieutenant (junior grade), lieutenant, and later as lieutenant commander. During the war with Spain he saw service as a lieutenant in the United States Navy from May to November, 1898. From 1904 to 1912 he held the rank of commander, commanding the District of Columbia's Naval Militia.

Engrossed in the work which engaged his attention at the Universities of Illinois and Chicago, Samuel Wesley Stratton early recognized the urgent need of a national bureau of standards to assist the United States in advancing commercially and industrially and in taking proper place in world commerce. Acting upon this thought, he brought to the attention of the then Secretary of the Treasury, Lyman H. Gage, the necessity for establishing such an institution. He was commissioned by Secretary Gage to prepare a bill providing for a bureau of standards and to take necessary steps for its proper introduction into Congress. Due largely to his untiring efforts, Congress enacted the measure on March 3, 1901.

When Samuel Wesley Stratton was proffered the appointment as the first director of the newly created National Bureau of Standards he felt it to be his imperative duty to accept this position. With his superior knowledge, accustomed energy, and ability in interesting others in the bureau he labored untiringly during his 22 years' service as its director, with the supreme satisfaction of witnessing its phenomenal growth from a small bureau employing a score, housed in temporary quarters near the Capitol, to the present magnificent group of 14 permanent buildings with a staff of over 900 employees, an institution to-day considered the foremost bureau of its kind in the world.

In recognition of the notable services which Samuel Wesley Stratton has contributed in the field of scientific research and in helping the United States and her allies to win the World War, institutions of learning—both at home and abroad—as well as foreign governments have conferred high honors upon him. The Government of France has made him a Chevalier of the Legion of Honor. He has received the Elliot Cresson Medal of the Franklin Institute and the Welfare Medal of the National Academy of Sciences. He has been a member of, and prominently identified with, the following nationally and internationally known bodies; International Committee on Weights and Measures; National Advisory Committee for Aeronautics; International Board on Ice Observation and Patrol; Standardization Committee, American Section, International Chamber of Commerce; and numerous other boards and commissions for the promotion of science and industry. Honorary degrees have been conferred upon him by three American universities and one English university. In addition to his bachelor of science, the University of Illinois, in 1903, conferred the degree of doctor of engineering; the Western University of Pennsylvania, in 1903, the doctor of science; the University of Cambridge, England, in 1909, the doctor of science; Yale University, in 1918, the doctor of science.

Whereas the weights and measures officials of the United States, representing the cities, counties, and States, meeting in Sixteenth Annual Conference at Washington, D. C., May 21, 22, 23, 24, 1923, are desirous of adding their humble tribute of profound respect and unbounded admiration for Samuel Wesley Stratton as a man, friend, and counsellor: Therefore be it

Resolved, That the National Annual Conference on Weights and Measures acknowledge with sincere appreciation the debt it owes to Samuel Wesley Stratton and the

privilege that has been enjoyed in receiving his guidance in its deliberations and his ready sympathy and great aid ever unstintingly given; and be it further

Resolved, That on this 24th day of May, 1923, Samuel Wesley Stratton be elected honorary president of the National Annual Conference on Weights and Measures with a life tenure of office.

Mr. PAUL. Mr. Chairman, I hope to have a rising vote on the adoption of the special resolution.

The ACTING CHAIRMAN. The question is on the adoption of the special resolution of the committee of which Mr. Holwell is chairman.

As many who are in favor of the motion manifest it by rising.

(The entire conference stood.)

It was unanimous.

Mr. SCHWARTZ. Mr. Chairman, I would like at this time to introduce a resolution:

Resolved, That the special committee on resolutions be appointed to present the engrossed resolution to Samuel Wesley Stratton at a time and place he designates, and that there be added to the presentation committee a representative of the manufacturers; and be it further

Resolved, That the conference, through its secretary, proceed with the work of engrossing the resolutions, and that the treasurer be authorized to execute a warrant in payment of same.

(A motion was made and seconded that the resolution be adopted, the question was taken, and the motion was agreed to.)

Mr. MARONEY. Mr. Chairman, in conjunction with that idea, I move you, sir, that Mr. Moynihan be designated a member of the presentation committee, and that the presiding officer cast the ballot of the conference.

(The presiding officer cast the ballot of the conference.)

The ACTING CHAIRMAN. Gentlemen, listen to the statement of your ballot. Daniel J. Moynihan has 1, and is elected a representative on this committee.

Mr. HOWE. Mr. Chairman, as a citizen of the District of Columbia, I can not keep silent at this time, since I feel that something should be said of what Doctor Stratton did for the city of Washington. When he took command of the Naval Militia of the District of Columbia, this organization met at a dilapidated wharf. In the short time that he was commander he had a model dock erected; also one of the finest, if not the finest, armory for Naval Militia in the United States.

REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY I. L. MILLER, CHAIRMAN, AND DISCUSSION THEREON.

The first resolution is as follows:

RESOLUTION OF APPRECIATION TO THE SECRETARY OF COMMERCE.

Whereas the Hon. Secretary of Commerce, Herbert Hoover, though busily engaged in affairs concerning the national welfare, gave freely of his time in addressing this conference: Therefore be it

Resolved, That the conference express its thanks and appreciation to Secretary Hoover for his address, which contained so many constructive ideas and such timely counsel on matters of vital interest to all weights and measures officials.

(The resolution was duly adopted.)

Mr. MILLER. The next resolution reads as follows:

RESOLUTION OF APPRECIATION TO THE DIRECTOR AND STAFF OF THE BUREAU OF STANDARDS.

Whereas the marked success of this Sixteenth Annual Conference of Weights and Measures has been due chiefly to the thoughtful and untiring efforts of Director G. K. Burgess and his assistants from the Bureau of Standards; and

Whereas the officials of weights and measures here assembled have been so instructed and encouraged that they can more effectively perform the duties required of them; and

Whereas each year's conference demonstrates more fully the value of the service, instruction, and cooperation rendered by the Bureau of Standards to the weights and measures officials: Therefore be it

Resolved, That this conference express to Director Burgess and his assistants its sincere appreciation and thanks for their kind services so generously given, for their hospitality and pleasant entertainment.

(The resolution was duly adopted.)

Mr. MILLER. The next resolution reads as follows:

RESOLUTION OF APPRECIATION TO W. A. DURGIN.

Whereas W. A. Durgin, chief of the division of simplified practice, Bureau of Standards, so ably presented to this conference the results of the activities of the division in securing the adoption of simplified methods and practices by manufactures with their resultant saving in labor and cost: Therefore be it

Resolved, That the thanks of this conference be extended to W. A. Durgin for the encouragement and inspiration which its members received from his excellent address.

(The resolution was duly adopted.)

Mr. MILLER. The next resolution reads as follows:

RESOLUTION OF APPRECIATION TO EXHIBITORS OF APPARATUS.

Whereas manufacturers of weighing and measuring devices and dealers in equipment for weights and measures inspectors have incurred much expense and have given freely of their time in transporting and arranging exhibits for inspection by the members of the conference: Therefore be it

Resolved, That this conference extend to these manufacturers and dealers, who have exhibited and demonstrated their products, its appreciation and thanks for the spirit of cooperation shown and the educational opportunities afforded.

(The resolution was duly adopted)

Mr. MILLER. The next resolution reads as follows:

RESOLUTION INDORSING HUNDREDWEIGHT STANDARD FOR DRY COMMODITIES.

Whereas the existing bushel weights adopted in various States and used in the buying and selling of grains, fruits, vegetables, and other dry commodities are unscientific, lacking in uniformity, conducive to confusion, mistakes, and waste of time in the computation of values; and

Whereas the use of the hundredweight basis wherever it has replaced the bushel standard has resulted in a greater degree of accuracy, the elimination of fraudulent possibilities, and a simplification and standardization of trade practices: Therefore be it

Resolved, That the delegates to this conference do recommend and urge upon Congress and the legislatures of the States the enactment of laws establishing the hundredweight as the basis for buying and selling all such grains, fruits, vegetables, and other commodities; and be it further

Resolved, That copies of this resolution be sent to the members of the Congressional Weights and Measures Committees and to the governors of the various States.

(The resolution was duly adopted.)

Mr. MILLER. The next resolution reads as follows:

RESOLUTION IN REGARD TO LIQUID METERS.

Resolved, That the subject of meters for the measuring of gasoline and oil be made a topic for papers and discussion at the next annual conference, with especial reference to their use as a practical method for gauging vehicle tanks.

I move the adoption of the resolution.

Mr. MARONEY. May I suggest that you add "taximeters" to that resolution. This subject is one that is coming up frequently in the larger places.

Mr. EGAN. Mr. Barron, of Minnesota, read a paper here on the "Sale of service by weight and measure," and it seems to me that if we adopt an amendment of that kind, making the resolution apply to taximeters, we will probably run into some legal tangle.

Mr. HOLBROOK. The paper which Mr. Barron read referred merely to the attitude of the courts upon the wording of a specific law. There certainly is no principle of law which makes it illegal to require service to be sold by weight or measure in any manner desired. The question was as to whether the present law of the State of Minnesota included within its provisions that requirement, and the decision was that it did not do so.

Mr. MCGRADY. Pennsylvania's weights and measures inspectors have no supervision of taximeters. In Pennsylvania that comes under the public service commission.

The ACTING CHAIRMAN. That is true in other States, and the chair would suggest that the resolution be accepted as was written.

Mr. MARONEY. Why should the chair make such a suggestion? I have a particular reason to ask for that to be incorporated. This is the school where we come for information. If I come here and want to learn something about taximeters or any other mechanical measuring device, I think I have a perfect right to request that such a device be incorporated. The floor ought to decide it.

Mr. FOSTER. I would like to say for the gentlemen present that in the State of Massachusetts the taximeter comes under the sealer of weights and measures.

Mr. HOLWELL. Mr. Chairman, in the city of New York taximeters come under the department of licenses, but I hold with Mr. Maroney that this matter should be discussed. I think it would be a wonderful help to the city of New York and other municipalities in the United States if we could have some authoritative recommendation by a body of this kind.

Mr. ROWE. Mr. Chairman, I would refer this to the resolutions committee for further consideration.

The ACTING CHAIRMAN. If there is no objection to the suggestion made by Mr. Maroney, the word "taximeter" will be included in this resolution.

Mr. EGAN. Mr. Chairman, we appointed a committee on resolutions. The chairman brought them in and read them, and at the last minute our friend, Mr. Maroney, attempts to incorporate something else that we have not had the time to consider.

The ACTING CHAIRMAN. Therefore, you make an objection. If you put it as an amendment, Mr. Maroney, we will vote on it.

Mr. MARONEY. Mr. Chairman, I move you, sir, that the addition of the word "taximeter" be made to the resolution.

Mr. ROBERTS. Mr. Chairman, I second the motion of Mr. Maroney. I do not know whether the amendment should be made or not, but I believe that any member of this conference should have the right to offer an amendment to any resolution that comes up; that he should be able to have a vote on it.

Mr. HOLBROOK. I think it might clarify the matter if it were stated that the amendment is intended to express it as the sense of the conference that taximeters should be considered next year. This can not be accomplished by the mere insertion of the word "taximeter," for in that case the resolution would state that taximeters be considered with especial reference to their use as a practical method for gauging vehicle tanks. If the amendment succeeds, the language should be modified to express the desire that taximeters be considered also.

The ACTING CHAIRMAN. I think, Mr. Holbrook, you have clarified the situation. The question is upon the adoption of the amendment offered by Mr. Maroney. Are you ready for the question?

(A vote was taken.)

The ACTING CHAIRMAN. The motion for the adoption of the amendment to the resolution is lost.

Mr. MARONEY. Mr. Chairman, I question that vote.

The ACTING CHAIRMAN. It seems to me that it is manifestly in the negative. However, I will put it to a rising vote.

(A rising vote upon the question was taken, and the count developed that 16 voted in the affirmative while 19 voted in the negative. Therefore the motion was lost.)

The ACTING CHAIRMAN. The question is now upon the adoption of the resolution introduced by the committee regarding liquid meters.

(The resolution was duly adopted.)

Mr. MILLER. The next resolution reads as follows:

RESOLUTION INDORSING ABOLITION OF DRY MEASURES.

Resolved, That we, the delegates to the Sixteenth Annual Conference on Weights and Measures, in convention assembled this 24th day of May, 1923, do hereby advocate the abolition of dry measures; and be it further

Resolved, That we recommend to the various State authorities the sale of dry commodities by weight, and urge that the necessary steps be taken to have all States so amend their laws as to put the spirit of this resolution into legal force and effect.

Mr. MILLER. I wish to explain that this resolution was handed to the committee signed by a number of the members of the conference. Since the committee did not come to a unanimous agreement on the resolution, it is submitted without recommendations.

Mr. BARRON. Mr. Chairman, there is one point on which we are in doubt; that is, whether all dry measures should be abolished. It is to be remembered that we have been trying to standardize apple barrels and containers which are based on this same dry measure. That is what I have in mind on it. I will offer a motion that the resolution be laid on the table.

Mr. MATHEWS. I think the intention of the resolution is to eliminate the bushel, peck, half-peck, and quart measures. If the wording could be changed to express this, it would be acceptable.

The ACTING CHAIRMAN. It has been moved that the conference lay the resolution on the table.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. BARRON. I do not want the conference to be misunderstood as indorsing dry measure. It seems to me that at some point it should appear as the consensus of opinion that since certain boxes and barrels in the nature of original shipping containers are recognized by State laws, and since these were not properly segregated from the measures used in retail sale by the wording of the resolution, the resolution was tabled. If another resolution to the effect that dry measures, such as now being used for retail sale in various places, be abolished could be introduced, and such resolution succeded, it would indicate more clearly the sense of the conference.

Mr. MATHEWS. May I ask the committee on resolutions if the resolution in relation to sales by the hundredweight, just adopted by this conference, does not take care of that?

Mr. MILLER. I have not had time to study the latter resolution. It was my impression, however, that this latter resolution is covered by the first resolution. While the first one eliminates the bushel weight and not the bushel measure, nevertheless it does eliminate the bushel measure by the recommendation for sale by 100-pound units.

Mr. BARRON. It has been our thought all along to sell everything on a weight basis. However, it would be hard for us to pack barrels of apples and always obtain a certain weight.

Mr. MILLER. I make a suggestion that the resolution be referred to Mr. Holbrook for suitable rewording, and that it be considered later.

Mr. MCGRADY. If the resolution refers to retail sales, I am heartily in conformity; I am not in sympathy with the Department of Agriculture's various sizes of berry baskets.

Mr. MILLER. The next resolution reads as follows:

RESOLUTION INDORSING 2,000-POUND TON FOR ALL PURPOSES.

Whereas much confusion exists among the various States on account of lack of uniformity in the weight of the ton of coal, 27 States specifying the net ton of 2,000 pounds, 1 State providing for the use of both the gross ton of 2,240 pounds and the net ton of 2,000 pounds, and 2 States and the District of Columbia, as well as the United States Government in its purchases, requiring the gross ton of 2,240 pounds exclusively, while 18 States do not define the number of pounds in a ton by law; and

Whereas this lack of uniformity is not to the best interests of either the consumers or the dealers in coal and should on this account be eliminated: Therefore be it

Resolved, That we, the delegates to the Sixteenth Annual Conference on Weights and Measures in convention assembled this 24th day of May, 1923, indorse all steps leading to the adoption, by Congress and by the various States, of legislation establishing the single net ton of 2,000 pounds for all purposes.

Mr. MILLER. This resolution was handed to the committee. The committee has not been unanimous in its report. Therefore, we submit this resolution without recommendation.

Mr. CLUETT. In urging the adoption of this resolution looking toward the establishing of the single net ton of 2,000 pounds for all purposes, I do so with the sole desire of securing uniformity and ending the confusion that exists among various States on account of the lack of uniformity in the weight of the ton for coal. As pointed out in the resolution, 27 States specify the net ton of 2,000 pounds, 1 State provides for the use of both the gross ton of 2,240 pounds and the net ton of 2,000 pounds, and 2 States and the District of Col-

umbia, as well as the United States Government in its purchases, require the gross ton of 2,240 pounds exclusively, while 18 States do not define the number of pounds by law. This is not to the best interest of either the consumers or dealers and should on this account be eliminated.

This resolution is not offered for the purpose of assisting the coal dealers to charge the purchasers for 2,240 pounds of coal when only 2,000 pounds are delivered, nor do I believe it will accomplish any such thing. Competition between dealers will prohibit any such cheating or profiteering, and the public press would not be slow to call attention to any such attempt.

One of the principal objects of these conferences is to secure uniformity in weights and measures and standard sizes. Secretary Hoover in his address advocated uniformity and simplification of sizes for containers for commodities and of articles of merchandise and pointed out the loss and wastage from the multiplicity of various sizes being used in trade. A "ton" is a size, and when we have a gross ton and a net ton, both of which are called a "ton," it is confusing and lends itself to errors, misunderstandings, and unfairness where comparisons are made of prices per ton between two States, one State using the net ton of 2,000 pounds and the other the gross ton of 2,240.

The 2,000-pound unit is a much easier and simpler unit to use in computing the number of tons purchased or sold than the 2,240-pound unit, with its odd 560 and 1,120 pounds for the quarter and half ton subdivisions. It is much easier for weighers and clerks to make mistakes in weighing and figuring. Standardizing the net ton of 2,000 pounds as the standard weight whenever the term "ton" is used would not prohibit or prevent any dealer from selling or consumer from purchasing 2,240 pounds in weight if they so desired as long as it was not called a ton. The law provides that 16 ounces avoirdupois shall constitute a pound, but this does not prohibit anyone from buying or selling 12 ounces of a commodity as long as it is not called a pound.

The theory for employing the gross ton in the sale of coal is that the extra 240 pounds is required to allow for the slate and impurities mined with the coal, and this amount will have a net ton of 2,000 pounds of coal; but a higher price is charged for 2,240 pounds than would be charged for 2,000 pounds. Price takes care of the difference in weight.

I can not see one thing in favor of the long ton except reverence for its antiquity. It was brought over from England in the *Mayflower* and, like many other things aboard that ship, needs revising and bringing up to date. I have heard that recently one of the British colonies, either Australia or New South Wales, has discarded the long ton and adopted the net in its stead.

I would like to point out a couple of inconsistencies where both the gross and net tons are used. In the State of Pennsylvania the law provides that the long ton of 2,240 pounds for anthracite and the net ton of 2,000 pounds for bituminous coal shall be used. Surely bituminous coal contains impurities as well as anthracite. In the District of Columbia all coal shall be sold by the gross ton of 2,240 pounds, but for coke the net ton of 2,000 pounds is considered to be enough. Why the distinction? It would seem just as reasonable

for the law to provide that in the sale of butter 16 ounces avoirdupois shall constitute 1 pound, but for butterine or butter substitutes 12 ounces shall constitute the pound.

I do not hold a brief for coal barons or dealers of any kind, nor do I consider them or any other class of dealers crooks or having ulterior motives when they advocate the establishing of a single uniform standard of 2,000 pounds per ton. I welcome their support and cooperation in any measure that tends toward the public good, and in this connection I wish to read a few telegrams from coal associations and coal dealers advocating and indorsing the adoption of the single net ton of 2,000 pounds for all purposes; also, a letter from U. S. Coal Commission, called the fact-finding commission, which says the commission has taken up the matter informally and unanimously favors the universal adoption of the 2,000-pound ton for coal, and intends in the report to Congress and to the President to recommend that, so far as interstate commerce is concerned, Congress should legislate in favor of the 2,000-pound ton.

The question has been asked, Why do we not adopt the gross ton for the standard? and my answer to that is that the figure 2,240 is harder to use in figuring than 2,000; that it lends itself more readily to errors and mistakes; and that it does not fit in with our hundredweight system. Furthermore, as 27 States out of 30 that define the weight of a ton specify 2,000 pounds as the standard, we prefer to adopt it and have the dog wag the tail instead of the tail wag the dog.

(Mr. CLUETT then read abstracts from telegrams and letters received by him in support of the 2,000-pound ton.)

Mr. ROBERTS. Mr. Cluett, may I ask you one question? Have you received any telegrams from consumers of coal in favor of this proposition.

Mr. CLUETT. No; I have not.

Mr. ROBERTS. I merely asked the question for information.

Mr. MCGRADY. Mr. Chairman, it gives me great pleasure to second this motion. There are no inspectors who have as much trouble as the inspectors of weights and measures for Pennsylvania with the long ton for anthracite and the short ton for bituminous coal. Quite a few of the retailers, through ignorance, not through intent to defraud the consumer, substitute the short for the long ton. We have a bill introduced in the present house, which was going along nicely when I left Harrisburg, making a uniform ton of 2,000 pounds for all coal in Pennsylvania.

Not long ago in the city of York there was a man arrested for selling short-weight coal. This delivery weighed 2,040 pounds, and he was honest in his belief that he was giving 40 pounds of coal overweight instead of giving 200 pounds underweight. But he should have employed the long ton instead of the short ton and this was actually short; and it cost him $100 for an attorney before he was through with it. So I am heartily in favor of this resolution.

Mr. PAUL. We want a standard. When we come to bread we fix standard-size loaves; and when we come to coal we want a standard, too.

Mr. Roberts asked a question of Mr. Cluett in regard to support from consumers for this resolution. I can say consumers do support one standard ton. For instance, our chamber of commerce consists of 1,500 or more members. Not more than five coal dealers belong

to that body, but its entire membership does use coal; they must have lots of steam. After you pick out the five coal dealers you have 1,495 users of coal, and they send me a telegram:

RICHMOND CHAMBER OF COMMERCE.

The Richmond Chamber of Commerce will appreciate your influence in support of having legislation enacted requiring 2,000 pounds of coal as a standard for a ton.

W. T. DABNEY, *Business Manager.*

That is what Richmond wants. Why do some of these other fellows not want it? The Richmond folk are not coal dealers, but they are coal users. We have a dollar that is a standard, and we should have a standard for coal. I hope this conference will go on record at this time as in favor of the resolution.

Mr. ROBERTS. You spoke of a standard for the dollar. Are you in favor of reducing the standard of the dollar?

Mr. PAUL. Well, the purchasing power is reduced already. When a man says he wants 2,000 pounds of coal he should get it.

Mr. ROBERTS. And if he wants 2,240 pounds of coal he should get it.

Mr. MCGRADY. I would like to compliment Mr. Paul, from Richmond, Va., upon his answer to Mr. Roberts. He answered him in the name of 1,495 members of the chamber of commerce.

Mr. CHAMBERS. I am from a coal section. Our State, West Virginia, had adopted the 2,000-pound ton. That is what we are using, and we have abolished all scales having a 2,240-pound beam. We allow nothing but a 2,000-pound ton. The producer gets paid only for 2,000 pounds per ton of coal as it comes from the mine, and it is delivered to the dealer as 2,000 pounds, and that is all he is charged for. Then, why should I go to the dealers and demand 2,240 pounds per ton?

Mr. SCHWARTZ. How are the miners paid?

Mr. CHAMBERS. They are paid on a scale basis of 2,000 pounds a ton.

Mr. ROBERTS. When you refer to miners, you mean the miners who dig the coal are paid on a basis of 2,000 pounds in West Virginia. Do you know how they are paid in Pennsylvania?

Mr. CHAMBERS. I do not know anything about Pennsylvania.

Mr. ROBERTS. I think it was stated here last year that they are paid on the basis of 2,240 pounds to the ton. If the selling weight of the ton is reduced, I wonder whether the miner will be paid on the basis of 2,000 pounds or whether they will continue to be paid on the basis of 2,240 pounds per ton. I discussed this question briefly last year before the conference, and it is not necessary to discuss it further. My reason for opposing it is substantially as I stated last year. There is one matter, however, to which I want to call the attention of this conference. This resolution was introduced at the request of the retail coal dealers. I appreciate Mr. Cluett's position in introducing it and I appreciate his reason for it. He was asked to do it by the people from his own city.

One gentleman last year said, "Your committee took into consideration only the telegram which was read here from the National Retail Coal Merchant's Association. * * *."

Now, I respectfully submit to this conference that while the request of the dealers should be considered, of course, it is not the only thing that should be considered. That is the reason I asked Mr. Cluett if

he had any telegrams from the consumer; and I ask the gentleman from Virginia if he has received any telegrams from Richmond signed by the laboring men, who must buy coal, as well as the members of the chamber of commerce.

Mr. PAUL. Mr. Chairman, I am a poor laboring man. I am a sealer of weights and measures, but for over 40 years and to this day I am a member of a labor organization, and if you want to know if the labor people want it ask them. I stand for what I think is right, whether for the laboring man or for the business man.

Mr. ROBERTS. I am opposed to this resolution for this reason: People in the District of Columbia have been accustomed for 100 years to buy coal at 2,240 pounds a ton. The people of the District of Columbia do not want this changed. When they buy a ton of coal it means 2,240 pounds to them. Two thousand pounds may mean a ton in other States, but it will be a long time before it is understood here.

Mr. GOODWIN. The working people constitute the large majority in this country, and I have received three telegrams from my people, although we already have a law in Rhode Island designating that 2,000 pounds shall be a lawful ton of coal.

(The question was taken.)

The ACTING CHAIRMAN. The vote is almost unanimous, only two members voting "No." The resolution is adopted.

Mr. HOWELL. I would like to offer the following resolution.

RESOLUTION IN REGARD TO TAXIMETERS.

Resolved, That it is the sense of this conference that taximeters be investigated and the subject be considered at the next conference.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. MILLER. The following is the redraft of the resolution concerning the abolishment of the dry measure:

AMENDED RESOLUTION INDORSING ABOLITION OF DRY MEASURES.

Resolved, That we, the delegates to the Sixteenth Annual Conference on Weights and Measures in convention assembled this 24th day of May, 1923, do hereby advocate the abolition of dry measures except in so far as they may have been recognized in the establishment of certain shipping containers now legalized by Federal law, or in some jurisdictions by State law; and be it further

Resolved, That we recommend to the various State authorities the sale of dry commodities by weight, in so far as this is practicable under the terms of the preceding paragraph, and urge that the necessary steps be taken to have all States so amend their laws as to put the spirit of this resolution into legal force and effect.

I move the adoption of this resolution.

(The motion was seconded.)

Mr. FOSTER. Mr. Chairman, I would like to call the attention of delegates to the condition in Massachusetts. During the fuel trouble this last winter the legislature saw fit to extend the scope of selling coal by the bushel, it being a much fairer way of distributing it, owing to the fact that coal absorbs a great amount of moisture if exposed, as to storms in transit. The law now permits the sale of coal either by bushel or by weight; also, at the present time oysters and clams are sold by the bushel. I do not think at this time it is quite right to abolish the bushel entirely.

Mr. MATHEWS. I think those articles can be sold by weight. Coal is put up in bags. Oysters and clams could be sold just as well by weight. I do not see any real objection to eliminating the dry measure.

The ACTING CHAIRMAN. The question is upon the adoption of the resolution.

(The resolution was duly adopted.)

Mr. SCHWARTZ. Mr. Chairman, I move you, sir, that the conference extend its thanks to Mr. Knauss, the efficient stenographer, and also to Miss O'Donnell, who has helped with the registration. I understand that Mr. Knauss is a smoker, and I move that we give him a box of good cigars; and for the lady, a nice box of candy.

(The motion was seconded, the question was taken, and the motion was agreed to.)

Mr. SCHWARTZ. Mr. Chairman, I would like to present the treasurer's report.

REPORT OF TREASURER, J. HARRY FOLEY.

Gentlemen: I herewith submit my annual report as treasurer for the year ending May 19, 1923:

Balance on hand last report		$134.25
Received from fees of delegates		102.00
Total receipts		236.25
Disbursements:		
May 24, 1922, to Doing Press for printing delegate, guest, and dinner tickets	$10.50	
May 24, 1922, to Pathe Exchange, for use of film at dinner	7.50	
May 24, 1922, to Ralph W. Smith for dinner tickets for guests, and cigars	14.50	
May 24, 1922, to Ralph W. Smith for use of picture machine and operator	15.00	
August 8, 1922, Gude Bros. Co., for flowers for memorial to Mr. L. A. Fischer	20.00	
		67.50
Balance on hand May 19, 1923		168.75

Respectfully submitted.

J. HARRY FOLEY, *Treasurer.*

The ACTING CHAIRMAN. Gentlemen, you have heard the report of the treasurer.

(A motion was made and seconded that the report of the treasurer be accepted, the question was taken, and the motion was agreed to.)

FLOWERS IN MEMORY OF LOUIS A. FISCHER.

Mr. HOWE. Mr. Chairman, I move you, sir, that a committee be appointed to place a suitable floral tribute on the grave of Major Fischer on Memorial Day.

Mr. HOLBROOK. I second the motion.

(The question was taken, and the motion was agreed to.)

Mr. MARONEY. May I suggest that Mr. Holbrook be designated to see that it is done.

Mr. SCHWARTZ. It seems to me that we have overlooked this young man, Mr. Holbrook's secretary, and I move you, sir, that we give him a $5 bill.

(The motion was seconded, the question was taken, and the motion was agreed to.)

(At this point a motion to adjourn was made and seconded, the question was taken, and the motion was agreed to.)

(Thereupon, at 12.40 o'clock p. m., a recess was taken until 1.30 p.m.)

EIGHTH SESSION (AFTERNOON OF THURSDAY, MAY 24, 1923).

The conference reassembled at 1.55 o'clock p. m., William B. McGrady, second vice president, presiding.

Mr. WEBSTER. Mr. Chairman, I have a resolution that I would like to present to the conference at this time, if you have no objection.

RESOLUTION IN RELATION TO STANDARDS OF QUALITY FOR COAL.

Whereas the American people are vitally concerned with existing conditions in the sale of coal and the problems connected therewith, notably: (*a*) lack of definite specifications as to quality, (*b*) unknown heat values of the various varieties, (*c*) effect upon same when sheltered or exposed: Therefore be it

Resolved, That it is the sense of this conference of the weights and measures officials of the United States, whose duties place them in intimate contact with the situation, that suitable action be taken by Congress to the end that an adequate legislative remedy be afforded the people of this nation by fixing the proper standards; and be it further

Resolved, That this conference recommends that the several States adopt as their standards those fixed by Congress or its authorized agencies.

I move the adoption of this resolution.

(The motion was seconded, the question was taken, and the motion was agreed to.)

REPORT OF COMMITTEE ON NOMINATIONS, PRESENTED BY WILLIAM F. CLUETT, AND ELECTION OF OFFICERS.

Mr. Chairman and delegates, your committee on nominations respectfully submits to this conference the names of the following members to act as officers of the conference and members of the executive committee for the ensuing year:

President, George K. Burgess; first vice president, William B. McGrady; second vice president, I. L. Miller; secretary, F. S. Holbrook; treasurer, J. Harry Foley; Members of the Executive Committee, all of the officers ex officio, R. F. Barron, S. C. Dinsmore, W. F. Cluett, A. H. Gibert, jr., H. N. Davis, T. F. Egan, C. M. Fuller, W. F. Goodwin, L. P. Strong, Charles A. Lutz, J. J. Holwell, A. W. Schwartz, Francis Meredith, H. A. Webster, Fred Benjamin, Lawrence Paul, G. M. Roberts, W. F. Steinel, George Warner, and W. A. Payne.

(Signed) W. F. CLUETT,
A. W. SCHWARTZ,
GEORGE WARNER,
T. F. EGAN,
W. A. PAYNE,
Committee on Nominations.

The ACTING CHAIRMAN. What action will you take in regard to the report of the committee on nominations?

(A motion was made and seconded that the secretary be instructed to cast the ballot of the conference for all of these nominations; the question was taken, and the motion was agreed to.)

(Accordingly, the secretary cast the ballot of the conference for the officers and members of the executive committee, as nominated by the committee on nominations, and they were declared duly elected.)

SUGGESTIONS CONCERNING PROGRAM OF SEVENTEENTH ANNUAL CONFERENCE.

Mr. STROBRIDGE. Mr. Chairman, I think one of the most important subjects which should come before us at the next annual conference is the general question of standardization of packages. We have all bumped up against the old story of about 40 different sizes of packages of the same commodity, put up purely and simply to deceive the people. I can illustrate very nicely by salad oil, which is put up in 4, 5, 6, 7, 8, 10, 12, 26, and 32 ounce bottles. A person asks for a half-pint of oil and may get a bottle marked 7 ounces. I think we should look into this question. I therefore move that a survey of this matter be made, and that it be discussed at the next conference, and move that a committee of five be appointed to investigate and report to the next annual conference upon the standardization of such commodities put up in package form as seem to be susceptible of ready standardization.

(The motion was seconded, the question was taken, and the motion was agreed to.)

The ACTING CHAIRMAN. The chair will appoint the following committee to consider this question: Mr. Holbrook, of the bureau; Mr. Smith, of the bureau; Mr. Strobridge, of California; Mr. Cluett, of Chicago; and Mr. Holwell, of New York City.

Mr. BARRON. I desire to make a suggestion which refers not so much to the program as to the hour of holding the sessions. It has been suggested as a possibility that we change the hours of the meeting from the present method of two sessions daily to one session daily, running to 1.30 or 2 o'clock, and thus leave more of the afternoon free for the delegates to see the city. I mention it because it has been talked about considerably.

Mr. MCGRADY. I think it would be a very good suggestion. I have attended some conferences that met daily from 9 until 1. We had just the one session and a very good one, and interest kept up until the last number on the program. We did not lose any attendance during the one session, and it left the afternoon free to permit the delegates to visit.

The ACTING CHAIRMAN. Personally, I think it would be a very good suggestion. You might put that in the form of a motion, so that this conference can go on record.

Mr. BARRON. My idea was to have some consideration before we take the matter too far. It occurs to me that the manufacturers come here with exhibits, and it might hurt that feature of the conference to have only one session.

Mr. MARONEY. May I ask how the bureau officials would feel about that? They must be given some consideration.

Dr. BURGESS. I would say with regard to the bureau that we have no preference one way or the other. I think it is quite possible that the manufacturers' exhibits might be made available during some part of an afternoon. That one feature could be put on some afternoon, if it suited the pleasure of most of you.

Mr. MARONEY. I think we should work in cooperation with the manufacturers and their representatives. I think it would be a good idea to give any manufacturer who has the time an opportunity to dissect his apparatus on the table before the presiding officer. It would give us the practical instead of the theoretical side of it.

Mr. FOSTER. Mr. Chairman, I move that the matter be referred to the executive committee to handle. They could handle it satisfactorily for all, since they know the sentiment of the conference.

Mr. HOLBROOK. Mr. Chairman, of course, as Doctor Burgess says, it is entirely immaterial to the Bureau of Standards and entirely at your own pleasure how long you hold your sessions. We have been accustomed to make four full days of it for two reasons: First, if we did not have the sessions proceed all day long we clearly might look for some adverse action by some of the governors of the States. With but one session daily they might think that the conference was something of a junket--merely an excuse to come to Washington—and that the real purpose was to get down to see the city and have a good time. If it is the consensus of opinion of the executive committee that it will not so appear, why morning sessions with afternoon recesses might be a good idea.

Another thing is in regard to the program. A year or two ago the suggestion was made—it was voted down, but it had some backing—that we hold the conference for five days instead of four. It was thought at that time that a five-day conference would be all right, provided at some time we demonstrated the ability to hold the delegates here through all four days. It was in the mind of the executive committee to give more attention to the putting on of a fuller program this last day, a program with lots of interesting features, to see if we could hold our delegates through the afternoon session. This small attendance at this session seems to indicate that we can not do it. We have had, as you know, a very much larger attendance on the three other afternoons. I think next year it would be very advisable, in view of our failure to hold our delegates, to have nothing more than the morning session on the last day, so that the business of the last day would not be handled by a mere handful; but, as I have said, it is entirely up to you. The suggestion made that it be referred to the executive committee is, I think, a good one, because that committee has enough members to be fully representative of the conference.

(The question was taken, and the motion was agreed to.)

TENTATIVE ADOPTION OF REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES ON SPECIFICATIONS AND TOLERANCES FOR VEHICLE TANKS.

The ACTING CHAIRMAN. The next number on the program is that of unfinished business.

Mr. HOLBROOK. Mr. Chairman, I would make a suggestion concerning the report of the committee on specifications and tolerances on specifications and tolerances for vehicle tanks. The committee recommended that the specifications and tolerances submitted be adopted tentatively only. While we would not care to proceed with the number now present on the final adoption of specifications and tolerances, it does seem to me that this report can be tentatively adopted without any impropriety. We can put it out and ask for comments and criticisms, so that next year when we come in session here we can adopt something finally that will represent the best thought on the subject that can be procured. This might be done at this time,

in view of the fact that you have had copies of this material in your hands for the last three days and are familiar with the recommendations.

Mr. MARONEY. I move you, sir, Mr. Chairman, that the report of the committee on specifications and tolerances on specifications and tolerances for vehicle tanks be tentatively adopted.

(The motion was seconded, the question was taken, and the motion was agreed to.)

INSTALLATION OF NEW PRESIDENT.

The ACTING CHAIRMAN. I will appoint Mr. Cluett, of Chicago, and Mr. Maroney, of Connecticut, to escort the new president to the chair.

(Doctor Burgess was escorted to the platform and took the chair as presiding officer.)

Dr. BURGESS. Gentlemen, I certainly appreciate most heartily this honor which has been conferred upon me. I do not consider it primarily a question of honor to me, personally, but rather a recognition of the leading position of the Bureau of Standards in your work. I can say most emphatically that it will be my most earnest endeavor to further and extend our activities in all fields pertinent to the work of the conference, and I know I can count on the support of all the State, county, municipal, and other delegates, and also the manufacturers interested in the subject. I hope that any of you who have any problems that should properly come before the conference in our annual meetings will take it upon yourselves to bring them either to the attention of the bureau or of the members of the executive committee, so that they may find their place adequately and promptly on the program.

I am sorry that I have not been able to attend all the sessions of the present conference, but it just happens that at this time the bureau had a very considerable number of administrative matters of the greatest urgency that had to be handled immediately. This is a condition that will not happen frequently, and if I am here I expect to be able to preside my proper proportion of the time in the forthcoming conference. I want to thank you again for the honor you have conferred upon me.

REPORT OF COMMITTEE ON TESTIMONIAL TO RETIRING PRESIDENT.

Mr. BARRON. Your committee appointed to take up the matter of securing a testimonial for our retiring presiding officer has received many suggestions. The one that has appealed the most to your committee is that we procure a medallion properly engraved or marked to express our appreciation of his activities. The cost of this can be prorated among the members desiring to contribute. I will be very glad to have any further expressions of opinion, or to have an expression of approval from the delegates if this idea is agreeable to them.

The CHAIRMAN. I take it this is a motion that a medallion be prepared.

Mr. BARRON. I will make it in the form of a motion.

Mr. GOODWIN. Mr. President, may I ask what form the medallion will be in and what markings will be on it, if any, to indicate from whom it came?

Mr. BARRON. It is to be suitably inscribed. We did not have an opportunity to go any further than that. We will cooperate with Mr. Holbrook and Mr. Smith here in Washington, and they think they will be able to take care of that part of it. It will be made and will be ready for presentation at the next conference, unless it is the wish of delegates that the presentation be made sooner than that. I think we can succeed in having Doctor Stratton here for part of the conference. It was impossible, of course, for the committee to make any arrangements to present it at the present meeting, and we thought that the opening day next year would be probably a very good time.

Mr. MARONEY. Mr. Chairman, I move you, sir, that the committee as aforesaid, together with Mr. Holbrook and Mr. Smith, be authorized to go ahead with the medallion suggested by Mr. Barron, and that the expenses will be assumed by the delegates attending the conference next year.

(The motion was seconded.)

The CHAIRMAN. It gives me very great pleasure to put this motion, because I think one of the things closest to Doctor Stratton's heart is this annual conference on weights and measures, and I know he will feel the incentive and use every opportunity to be present.

(The question was taken, and the motion was agreed to.)

(It was moved and seconded at this point that the conference adjourn. The question was taken, and the motion was agreed to.)

(Thereupon, at 2.40 o'clock p. m., the Sixteenth Annual Conference on Weights and Measures of the United States adjourned sine die.)

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